

I. Introduction:

This strategic plan is a summation of resources in Gallatin County to provide a guiding document to the Natural Resources Conservation Service and its partners. This tool will provide a synopsis of the county, where current conservation activities are taking place, where untreated resource concerns remain and where future efforts might target. The plan will be used in Gallatin County to analyze funding priorities in the future and continue a broad partnership with the common goal of strategically installing conservation practices on the ground.

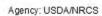
This Natural Resource Long Range Strategy covers the period from 2019–2024. The strategy will serve as the guiding document for NRCS decisions regarding delivery of financial and technical assistance and administration of Farm Bill programs. This is a living document, intended to be updated and modified, as appropriate, to account for emerging issues.

II. History

Located in a valley in the heart of the Rocky Mountains, Gallatin County is the most populated and fastest growing county in southwest Montana. The County Seat of Bozeman at large encompasses over 50,000 people. Located in a spectacular Rocky Mountain setting, it is close to world-class downhill skiing, blue ribbon trout streams, Yellowstone National Park and a multitude of other outdoor activities in the nearby wilderness areas. Gallatin County covers over 2,500 square miles of mountain lands varying in topography and climate from temperate river valleys to snow-capped peaks and open ranch lands. Nearly half of all the land in Gallatin County is under public ownership administrated by the Gallatin National Forest, State of Montana, Bureau of Land Management or the National Park Service (See Figure 1).

Gallatin County, named after President Thomas Jefferson and President James Madison's Secretary of the Treasury, Albert Gallatin, is full of history. The area within Gallatin County has been inhabited by native peoples dating back thousands of years. Tribal bands including the Shoshone, Nez Perce, Blackfeet, Flathead, and Sioux. The area was rich with game, water, and plants used by the natives. The Lewis and Clark Expedition left the first written description of the valley in both 1805 and 1806 during their epic journey. The Bozeman Trail was the northern spur off of the Oregon Trail. When gold was discovered 80 miles to the west of Bozeman, the rush was on over the new Bozeman Trail, established by John Bozeman. Many who followed this trail for gold returned to the Gallatin Valley to take up farming and business and as a result the town of Bozeman was formed in 1864. In 1883 the Northern Pacific Railway finished its pathway to Bozeman through what is now known as Bozeman Pass. This route paralleled the Bozeman Trail and is now Interstate 90. The town grew slowly, reaching a population of 3,500 by 1900. The Northern Pacific Railroad had completed its line through the town in 1883, and Montana Agricultural College held its first classes in 1893.

Established in 1863, Gallatin County is located in the southwest part of Montana. Gallatin County encompasses 2,500 square miles. Much of the private land is fertile farm fields, while over 40% is managed by the U.S. Forest Service. (Figure 1. Public land in Gallatin County).



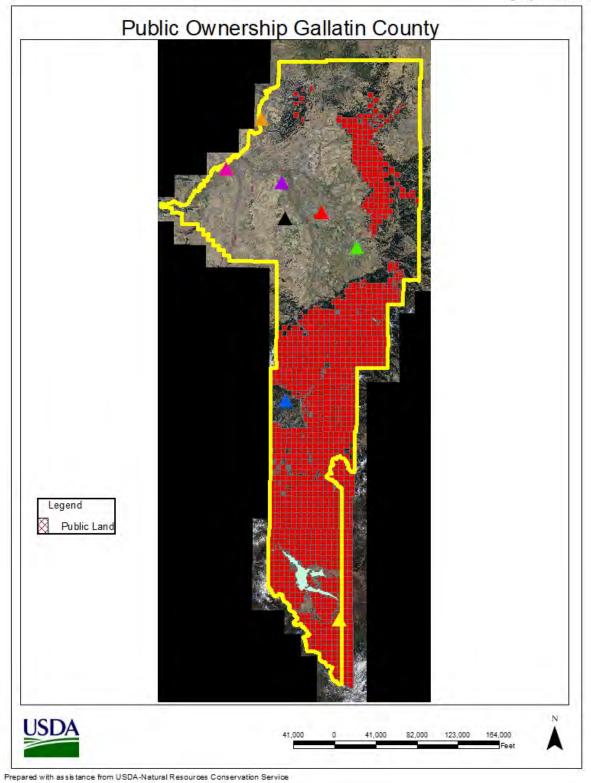


Figure 1; Public land in Gallatin County

Owner	Acres
US Government	6.6
US Bureau of Land Management	7248.8
US Fish and Wildlife Service	174.2
National Park Service	64579.6
US Forest Service	653163.5
State of Montana	149
Montana State Trust Lands	49874.6
Montana Fish, Wildlife, and Parks	11425.5
Montana University System	2273.5
Montana Dept of Transportation	155.8
Montana Dept of Natural Resources Water Projects	72.5
County Government	1157.3
City Government	4211.6

Table 1; Acres in Public land (Gallatin County Website)

Yellowstone National Park came about after the establishment of Fort Ellis in the Gallatin Valley and the quieting of political turbulence in the Gallatin area. Rumors coming out of nearby Yellowstone Valley prompted a group of leading citizens to explore the region. This group of men, known as the Washburn-Langford-Doane Expedition, brought about the establishment of Yellowstone National Park on March 2, 1872. It was the United States' first National Park.

Today, Gallatin County, Montana 's estimated population is 107,810 with a growth rate of 3.59% in the past year according to the most recent United States census data. Gallatin County, Montana is the 3rd most populous county in Montana. The major communities are Bozeman, Belgrade, Three Forks, Big Sky, West Yellowstone and Manhattan.

III. Climate

The continental divide, west of Gallatin County has a considerable effect on the climate of Gallatin County, with the divide restricting the flow of warmer Pacific air from moving east, and drier continental air moving west. Consequently, the climate of Gallatin Valley is semiarid with cold winters and short cool summers (Hackett, O.M., et al 1960). Bozeman's average yearly temperature is 56 degrees with the average growing season approximately 107 days at an elevation of 4793'. The average temperature is 13 degrees in January and the mean temperature in August is 81 degrees with average mean snowfall at 73.1 inches. (Gallatin County Website; https://gallatin.mt.gov).

The current collection of global climate models generally agree that Montana temperatures will continue to increase through the 21st century. (Whitlock C, et al., 2017). Rising temperatures will reduce snowpack, shift historical patterns of streamflow in Montana, and likely result in additional stress on Montana's water supply, particularly during summer and early fall. Montana's growing season length is also increasing, due to the earlier onset of spring and more

extended summers; we are also experiencing more warm days and fewer cool nights. From 1951-2010, the growing season increased by 12 days. In addition, the annual number of warm days has increased by 2.0% and the annual number of cool nights has decreased by 4.6% over this period (Whitlock C, et al., 2017).

With increased temperatures and the observational record confirming that the average annual snowpack has declined in large portions of the American west (Mote 2003) and will likely continue to decline, due to more precipitation falling as rain rather than snow. Less surface water will be available in summer and late fall in the snowpack driven watershed of Gallatin County. Additionally, historical observations show a shift to earlier snowmelt and peak runoff in snowpack driven watersheds common in Gallatin County (Pederson et al. 2011a). This snowpack acts as a natural reservoir, slowly releasing water during the spring and early summer, sustaining approximately 2 million acres of irrigated farmland in Montana (Pierce et al. 2008). Peak flows in local streams and rivers usually occur in May and June, as snow melts in the high elevation areas and precipitation falls in the form of rain (Gallatin Watershed Sourcebook: A Resident's Guide, 3rd ed). Snowpack from the Gallatin and Madison Ranges contributes runoff to streams later in the season than does snowpack from Bridger Mountains due to the deeper snowpack and higher elevations and as a result is a more dependable source for late-summer irrigation. Consequently, with less snowpack coming into the irrigation season and earlier runoff, agricultural producers will need to find alternatives to addressing less water availability later in the irrigation season than in the past. Efforts to improve the water holding capacity of soils by increasing the organic matter level is ongoing, however these efforts are localized, take a long time and are somewhat constrained by the existing soils present. Irrigation efficiency has also increased with the conversion of flood, handlines and wheel lines to pivot irrigation systems. While providing irrigated crops with the right amount of water at the right time, this conversion to more efficient irrigation systems may also negatively affect groundwater supplies by reducing the amount of irrigation water that had supplemented ground water or recharged aquifers.

Montana receives significant spring precipitation, with a statewide average of 5.8 inches (14.7 cm) (Whitlock C, et al. 2017). This spring precipitation contributes to the recharge of shallow soil moisture and groundwater supplies an important part in Montana's water cycle by releasing water slowly throughout the summer. Convective thunderstorms are responsible for most of the summer precipitation across the state and at times may produce large amounts of damaging hail (Whitlock C, et al., 2017).

Ground water utilization will likely increase as elevated temperatures and changing seasonal surface water availability will force users to seek alternatives. In a typical year, the majority of western Montana's precipitation falls as winter snow (62-65%) of total annual precipitation (Serreze et al. 1999). This natural bank of water supports Montana's ecosystems and economies as it melts in the higher elevations and then flows east or west off the Continental Divide. Reductions in recharge are expected for mountain aquifer systems because of decreased snowpack and changes to patterns of infiltration. Snowmelt is more favorable to infiltration than rainfall events; therefore, as an increasing percent of precipitation falls as rain instead of snow, infiltration is likely to decrease.

Efforts to increase irrigation efficiency, improve the water holding capacity of soils, exploring water storage options and other efforts to more effectively manage surface water resources by water right holders will reduce the percentage of water use by agriculture, which is currently 12.4% of the total water use within Montana (MT DNRC, 2015.). Development and population growth will add additional pressure on water resources in Gallatin County as both Bozeman and Big Sky are looking for additional water supplies as they also seek to increase water use efficiency as they seek to balance the demands of a growing population and existing resources.

Precipitation

	Jan	Feb	Mar	Apr	May	Jun
Average high in °F:	35	38	47	56	65	73
Average low in °F:	14	17	24	30	38	44
Av. precipitation in inch:	0.55	0.6	1.02	1.8	2.8	2.8
Average snowfall in inch:	9	6	8	4	1	0

	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F:	83	82	72	58	43	33
Average low in °F:	50	48	40	32	21	12
Av. precipitation in inch:	1.42	1.2	1.26	1.4	0.91	0.6
Average snowfall in inch:	0	0	0	3	8	11

Table 2; From U.S. Climate Data (https://www.usclimatedata.com/climate/bozeman/montana/united-states/usmt0040

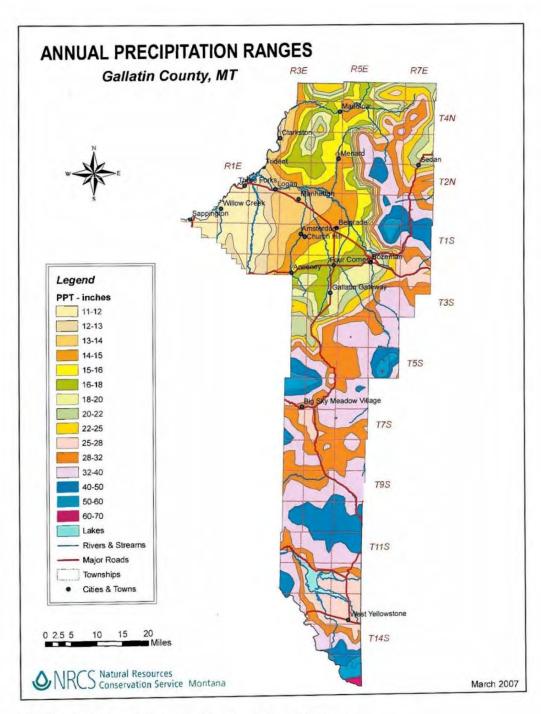


Figure 2; Annual Precipitation in Gallatin County

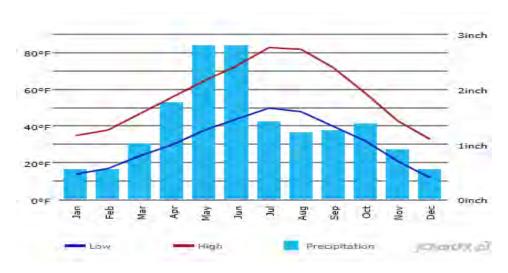


Figure 3; From U.S. Climate Data (https://www.usclimatedata.com/climate/bozeman/montana/united-states/usmt0040)

IV. Natural Resource Inventory

This section of the Gallatin County Long Range Conservation Strategy examines the current natural resources in the county. Resource concerns have been divided into the categories of Soil, Water, Plants, Animals, Air, Energy and Human. Demographics for the county are under the human category. Information gathered to compile this portion of the Strategy was obtained from numerous sources, including but not limited to the U.S. Department of Commerce, Headwaters Economics, Montana Natural Heritage program, U.S. Department of Agriculture National Agricultural Statistics Service.

The information contained in the natural resource inventory, past conservation efforts and from data presented within this document will focus our future conservation efforts with our partners to address resource concerns.

A. Resource Concern-Human

Although agriculture still dominates parts of the Gallatin Valley landscape, its contribution to the overall local economy is declining, not because farming or ranching has not been profitable but because of the increase in non-farm earnings relative to on farm earnings. While agriculture is a smaller component of Gallatin County's overall economic base, it does provide important contributions to the county in the form of economic diversity, open space and culture. Total net income from farming and ranching dropped from \$31.1 million in 1970, to \$2.4 million in 1985, and to \$7.1 million in 2000 (Gallatin County Growth Policy April 15, 2003). Recent numbers from the 2018 NASS (National Agricultural Statistics Service) report indicate that net farm income for 2016 had risen back to \$68.6 million. Such drastic reductions and fluctuations have impacted local land use, especially with volatile agricultural markets that fluctuate widely depending upon the year, climate factors, politics, natural disasters, etc. In many cases, it has become more profitable to subdivide the land for housing rather than farm or ranch. This trend has contributed to an outward expansion of development, challenging the communities to further define appropriate growth and prompting much debate over terms like leapfrog development and

sprawl. The proportion of people living in incorporated areas peaked in 1970 at 70 percent, dropping to 58 percent by 1990.

The majority of residents (62%) are between the ages of 18 and 65 in Gallatin County, with 26% below the age of 18 and a median age of 32. Ninety five percent of the population is white with 48% of the population female (United States Census). Gallatin County's population has doubled since 1990 with a current population of approximately 111,876 (U.S. Census)

Population Change 2000-2015

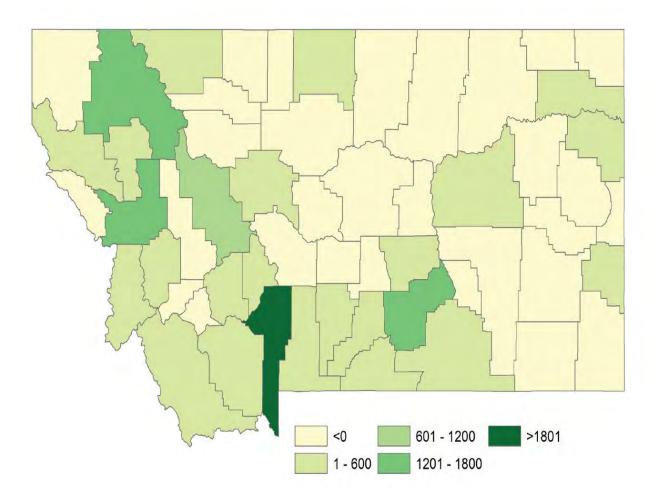


Figure 4; From Headwaters Economics

Farming is the only sector that lost jobs since 2001. Every other industry is growing. Professional and technical services, real estate and rental and leasing, accommodation and food services, health care and social assistance, and retail trade are growing the fastest (Headwaters Economics 2018).

Gallatin County continues to be one of the most economically stable counties in the State of Montana. The basis for the stability is in part due to Montana State University and United States Department of Agricultural being based in Bozeman, but also due to continued presence of tourists. Located near Yellowstone National Park, two destination ski areas, and rivers full of trout, tourism has played a significant role in helping maintain local economic stability.

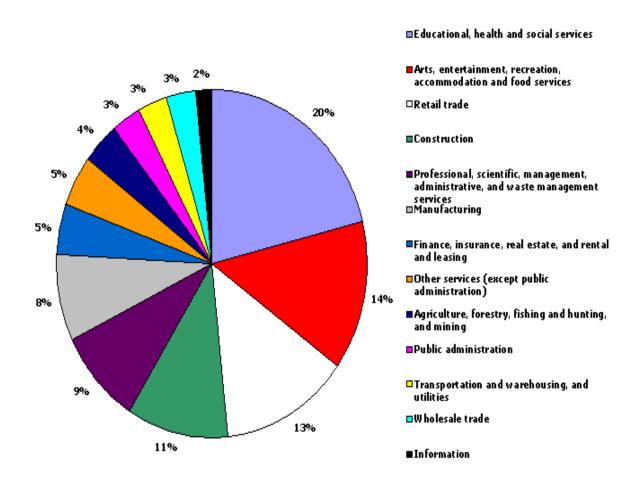


Figure 5; From Gallatin County, Montana website

Gallatin County	2007	2012	% Change
Number of Farms	1071	1163	8
Land in Farms (ac)	776868	702713	-11
Average Size of Farm	725	604	-17

Table 3; From Montana Agricultural Statistics 2018

Retaining viable working farms and ranches though conservation easements has contributed to maintaining a healthy agricultural economy in Gallatin County. Through the efforts of land trusts, NRCS, and Gallatin County, a significant amount of land is protected from development through the strategic establishment and purchase of conservation easements.

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Figure 6; Easements in Gallatin County; NRCS data

B. Resource Concern-Plants

Gallatin County can be divided into three distinct regions. The first is the national forest managed by the U.S. Forest Service, which is largely above 5500' and forested with Douglas fir, lodgepole pine, Engelmann spruce, subalpine fir, white bark pine, limber pine, and aspen. The second region is the developed land, housing, streets, and urban areas. The third region is the working lands, including pasture, forest, range and cropland, both irrigated and dryland. The principal crops grown in the county are winter wheat, spring wheat, alfalfa, grass hay, barley, oats, peas, canola, chickpeas, potatoes and some silage corn. This report will focus on the private working lands portion of the county since this is the area that aligns within the scope of the Natural Resources Conservation Service mission of 'helping people help the land'. There is a federally listed plant species, *Ute Ladies' Tresses* listed as threatened by the United States Department of the Interior; Fish and Wildlife Service. The plant species of concern list for Gallatin County is included in Appendix D.

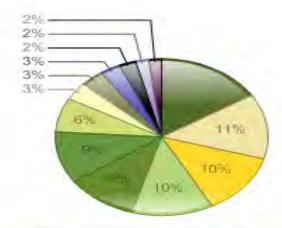




Figure 7; Gallatin County is comprised of multiple land cover types. From Montana Natural Heritage Program

Working lands

Pasture

There is limited and shrinking acres in pasture within Gallatin County due to a number of reasons. First, given the amount of population growth, there has been a tremendous amount of

land conversion within the past 10 to 20 years from open space (i.e. pasture) to developed land. Additionally, with less total land available for pasture the remaining acres tend to be overgrazed. Some of the remaining pasture land has been subdivided into small pastures that tend to be stocked with horses, not confined, where often the pasture becomes degraded from season long overgrazing. Weeds are able to invade, persist and expand on these smaller pastures when these areas have been overgrazed. Smooth brome, timothy and creeping foxtail, and other non-native grasses, dominate many of the smaller acreage pastures associated with horses in the county. To address resource concerns on pasture land a system of structural practices including but not limited to cross fencing, water development, improved forage species mix, weed control and management strategies such as prescribed grazing may be necessary in whole or part.

Range

The rangeland within Gallatin County is also losing acres due to land conversion/development. Coinciding with land development is the issue of access to rangeland. With limited access and a shrinking land base of native rangeland, overgrazing and weed infestation have become resource concerns on some acres of rangeland. Wildlife are also a concern given the limited amount of space available for animals given the amount of land development in the Gallatin Valley and competition for the limited resources remaining with domestic animals.

Historically the native plant community was dominated by cool-season perennial bunchgrass species, primarily (bluebunch) wheatgrass, some tall needlegrasses and a few rhizomatous mid-sized grasses such as western or thickspike wheatgrass and short grasses with minor components of perennial forbs and low growing shrubs. Degradation in the historic climax plant community has moved much of the plant community toward smaller, early seral, less palatable species, largely due to lack of fire and long term heavy continuous grazing.

Wet meadows and riparian areas tend to be in native vegetation due to the difficulty of operating machinery on wet soils. These areas are typically the most biologically diverse and important as they can provide sanctuary and are utilized as travel corridors. These ecotypes are generally fairly productive, consequently they are often over utilized which can lead to degraded streambanks and negative impacts to water quality.

To address resource concerns on rangeland, a system of structural practices that could include cross fencing, water development, native plant enhancement, and weed control along with prescribed grazing may be necessary.

Forest

Fire suppression, past forest management, land use decisions and other forest stressors have generated dense overcrowded forest stands, leading to declining tree vigor, and placing the oldest and most structurally valuable trees at risk of high-intensity wildfire. Disease and insects, such as western bark beetle and spruce budworm are able to establish in these dense stands as a result of stress on the forest. Concurrent with declining forest health are other natural resource concerns such as altered water quality and quantity, air quality, degraded fish and wildlife habitat, and reduced biodiversity and ecosystem resilience.

According to the 2017 Final Timber Report for the Custer Gallatin National Forest approximately 13.6% of the total county acreage (221,300) is suitable for timber production. The most common tree species within Gallatin county are Douglas fir, subalpine fir, lodgepole pine, Engelmann spruce, limber pine, aspen and white bark pine. Spruce and aspen are typically found in wetter areas, with the white bark pine only at higher elevations within the National Forest. Excluding riparian areas, aspen communities are considered the most biologically diverse ecosystems in the Intermountain West (Kay 1997). Aspen decline in the intermountain west may be attributed to a number of factors, including successional to conifers, disease, browsing, and a decrease in available water (Bartos, D. L. 2001). Limber pine can be found in some of the drier areas within the county and lodgepole pine is scattered across the county with large stands around the towns of West Yellowstone and Big Sky. Douglas fir and subalpine fir may also be found throughout the county above 5,000 feet where most of the coniferous forest begins.

To address resource concerns on the private forested land within Gallatin County, a robust program of pre-commercial thinning, fuels reduction, weed control, native grass and forb enhancement, water development, cross fencing and prescribed grazing (if grazed) may be necessary. These are all tools and should be evaluated together individually and as a system to determine if natural resource goals are being accomplished.

• Irrigated Cropland

In general, crops grown on irrigated land include, spring wheat, barley, alfalfa, potatoes, and some corn and canola. The seed potato industry within Gallatin County has a reputation for growing some of the "cleanest" certified seed potatoes in the country. Gallatin County is uniquely suited for seed potato production, given that potatoes are highly susceptible to disease, because the of the high altitude, cold temperatures and the strict regulations and testing through the Montana State Potato lab. Soil erosion can be an issue with potato production given the amount of soil disturbance and lack of vegetative cover when preparing the ground for seeding and after harvest. Several farms within Gallatin County have upgraded their irrigation systems from flood irrigation to wheel lines and hand lines and finally to center pivots over the past few years, although there are still many irrigation systems that could be upgraded to increase water use efficiency. In those areas where irrigation efficiency has increased dramatically there has been some negative consequences where the water table has dropped considerably.

While irrigation efficiency has improved, irrigation water can become scarce as stream flows drop during the summer. There is excess water during spring runoff but no way to store the water off farm for later use other than Hyalite Reservoir, which services a limited amount of irrigation systems.

Land conversion from farmland to developed land has presented a number of unique challenges for irrigators. One such issue is the ability to deliver water to all users and water rights holders on some ditches. When farmland is developed and the water is no longer utilized for irrigation there may no longer be enough diverted water in the canal or ditch to reach the end users. Additionally, canals or diches may be negatively affected as they pass through developments

from either illegal use, blockage or from general lack of knowledge of laws governing canals and ditches as they pass through private property on easements.

Weed issues on irrigated cropland are generally low due to the ability of farmers to control weeds through several strategies, including herbicide spraying and tillage. There have been some undocumented reports of chemical resistant weeds in the county including but not limited to wild oats.

Fertility on irrigated land is an important issue in the county given that a number of streams have been designated as impaired due to high levels of nitrogen and phosphorus, see figure 10. Given that irrigation water may be lost later in the growing season, many producers apply extra water earlier in the season to bank the water in the soil. Over irrigating however, may drive nitrogen down through the root zone where it can enter groundwater sources. Also, phosphorus may be lost from cropland fields as surface runoff where it can enter streams, ditches or other water bodies.

To address resource concerns on irrigated cropland, irrigation infrastructure, specifically the delivery and application of irrigation water in an efficient timely manner is critical in addressing resource concerns on irrigated cropland. Irrigation pipelines, pumps, water control structures and sprinkler systems used with irrigation water management will provide adequate water to plants when necessary. While some irrigation conveyance is shut down earlier in the growing season, having an efficient irrigation system along with maintaining or improving the organic matter in the soil will increase the amount of water available for crop production. Nutrient and pest management are also critical in irrigated systems where excess water may encourage disease or insect outbreaks and where nutrients applied for crop growth may be lost via runoff or deep percolation. Crop rotation is important in reducing pests and disease and in some cases may be able to access nutrients and water from the soil profile that previous crops were unable to access. Fall seeded cover crops may be able to help reduce soil erosion from ephemeral gullies that appear in the spring. Farmland that has a limited amount of residue remaining from previous crops and are on fields with undulating terrain, with steeper slopes are more likely to experience ephemeral gullies.

• Dryland Cropland

Typical crops grown on dryland fields include, spring wheat, malt barley, and winter wheat, with a period of fallow. Dry cropland had traditionally been in a crop fallow rotation. However, this has been evolving over the past few years with producers trying cover crops as a fallow replacement or moving toward continuous cropping at least 2 out of 3 years. With more dryland acreage moving toward having some cover most of the time, wind erosion has decreased. Tillage after harvest and during the fallow years has decreased with the adoption of chemical fallowing the land. Weed resistance, however, has forced some producers to utilize tillage to reduce weed populations.

Dry cropland is more apt to become developed due to the limited amount of infrastructure related to irrigation and to the reduced potential profitability of dryland compared to irrigated land. Land conversion from agriculture to developed land is a serious concern as mentioned above.

Many of the most productive soils in Gallatin Valley have already been converted to developments. However, increasing the viability of dryland farming would enhance the ability of these producers to maintain farming in a fast evolving and growing community.

To address resource concerns on dryland cropland a system of practices including crop rotation, soil fertility and the utilization of cover crops, where appropriate, may be necessary to make these operations more economically viable thereby reducing the potential for land conversion. Soil fertility issues related to dryland farming can be an issue if fields are fertilized for a particular yield goal and not enough moisture is received to meet that goal, leaving excess fertilizer in the fields. This results in excess fertilizer (particularly nitrogen) left in the soil where it poses a risk to ground water or can lead to soil acidification over time. Continuous farming or utilizing cover crops in lieu of fallow will aid in utilizing any excess fertilizer from the prior cash crop. Crop rotation can be an important tool on dryland where a crop with lower moisture requirements may be harvested.

Weeds

Noxious weeds are destructive to Montana's landscape and the livelihood of ranchers, farmers, recreationists and others by displacing native plants, increasing soil erosion, decreasing wildlife habitat, diminishing water quality, reducing forage for livestock and reducing real estate values. Noxious weeds are non-native plants that compete with desirable plants for water, nutrients, light and space. Noxious weeds are a serious problem in Gallatin County with over 40 noxious weeds on the State of Montana and Gallatin County Noxious Weed List, as well as five regulated plants, three of which are aquatic invasive plant species. Gallatin County has seen a dramatic increase in small acreage landowners, many of which are not familiar with noxious weeds or their impacts.

While there are over 40 listed noxious weeds in Gallatin County, the type of land use largely determines what weed issues you might have on your property. For instance, cheatgrass is highly invasive in range and pasture land settings but is largely controlled in cropland settings. Understanding the lifecycle and habitats of these weeds aids in preventing initial infestations and controlling established stands of weeds. Once established these weeds are difficult to manage and when a new weed appears a concerted effort is made to eradicate it as quickly as possible to prevent its spread. For instance, Ventenata is a major concern in Gallatin County and has only been identified within the county in the past few years. Ventenata is a highly invasive annual grass that has virtually no forage value for livestock. Ventenata has the potential to cause impacts to grazing, haying and wildlife habitat. Weeds are a common problem on almost all land uses including forest, and residential properties. Implementation of an effective noxious weed management plan across large areas is necessary to prevent further deterioration of the forage base.

C. Resource Concern-Soil/Geology (Most of the following information is taken from the Soil Survey Manuscript and Geology and Ground-Water Resources of The Gallatin Valley, Gallatin County, Montana and from Kari Scannella, NRCS state geologist)

Soils support terrestrial life by providing nutrients for plant growth through their ability to allow air and water to enter through the soil surface and percolate through the soil profile, the ability to store water for plant use while also allowing for the drainage of excess water, the ability to buffer the soil pH and detoxify contaminates, the ability to limit both wind and water erosion, and the ability to support micro and macro soil organisms. Soil quality is a function of the soil's inherent potential and the effects of management actions on the soil.

Gallatin Valley is an intermontane basin, or a wide valley set between several mountain ranges. The valley is approximately 25 miles long, 20 miles wide, and filled with approximately 25 to 400-feet-thick alluvial deposits. Underlying alluvium is bedrock. The Bridger and Gallatin Mountains flank the valley on the east and south, the Horseshoe Hills on the north, and the Tobaccos Root Mountains on the west.

The oldest rocks in the valley, referred to as basement rock, date back to the early Precambrian (4.5 billion years ago to 541 million years ago). Basement rocks consist mostly of hard, coarse-grained gneiss, schist, and quartzite that are hosts to a variety of economically significant minerals, such as lead, zinc, silver, copper, and gold.

During the Paleozoic (541 mya to 251.9 mya) most of Montana was slightly below sea level. Lower elevations became submerged by water and accumulated thick sequences of marine sand, mud, and lime mud that would later lithify into sandstone, mudstone, and limestone. Whereas, landforms above sea level became islands or coastal plains. Gallatin Valley at that time was analogous to the present-day Caribbean, warm and tropical. Cambrian (541-485.4 Mya), Devonian (419.2 -358.9 Mya), Carboniferous (358.9 – 298.9 Mya) and possibly Permian (298.9 – 251.90 Mya) age rocks are present in the valley.

From the Precambrian to the beginning of the Mesozoic (240 to 66.0 mya), shallow seas advanced and retreated, depositing thick sequences of mostly marine sediments, evidenced by about 10,000-feet-thick marine limestones and dolomites and non-marine shale, mudstone, siltstone, and sandstone rocks.

By the Late Mesozoic (Late Cretaceous Period, 100.5 to 66.0 mya), the environment became more dynamic as the seaway retreated for the last time. Intense folding and faulting occurred around 66 million years ago due to crustal collisions to the west. Belt Supergroup rocks in western Montana faulted and shifted eastward to where they currently are exposed in northern Gallatin County. Tectonism uplifted and folded older rocks to form the ancestral Rocky Mountains. Mesozoic aged rocks are approximately 5,280 feet or one mile thick and make up approximately 55 percent of the state.

Early to middle Tertiary (Eocene, 66.0 to 33.9 mya) was dominated by crustal stability and long, quiet erosional periods that sculpted and shaped the topography. During this time, the Three Forks Basin dropped while the Bridger Mountains uplifted. From late Tertiary to present day, erosion produced sediment which deposited into basins. Simultaneous to the erosion, intense volcanic activity dominated and formed the Boulder Batholith to the west and the Absaroka-Gallatin Volcanic Field to the east.

The Three Forks structural basin, where Gallatin County is located, was formed as the result of crustal movements in early Tertiary time. The basin was filled to a depth of 4,000 feet with volcanic ash, sand, silt and clay. Precambrian metamorphic rocks and sedimentary rocks are the oldest rocks exposed in the valley. The metamorphic rocks are varieties of gneiss, in general. The sedimentary rocks belong to the Belt series and consist of sandstone, conglomerate, and slate.

Alluvial fans extend into the Gallatin Valley from the foot of the Gallatin and Bridger ranges. Loess, calcareous silt is widely present within Gallatin County and has contributed to the productivity of land within the county, although this soil is highly erosive.

In Gallatin County soil disturbance, i.e. tillage, is still widely practiced especially on irrigated cropland. Tillage and fallow have decreased in the county in the past few years,

The survey area for Gallatin County, Montana includes forested land, generally above 5000 feet in elevation, the transitional area between the mountains and valleys and the valley floor. The Soil survey of the Gallatin National Forest includes the Bridger range which consists of a long narrow limestone ridge flanked by foothills and the Gallatin and Madison ranges which contains ridges, steep stream-cut and glacial valleys and broad, sloping valleys. In general, the soils of the Gallatin Valley are fine-textured, heavy alluvial or silty loams.

Many of the important agricultural soils in the Gallatin Valley are formed in calcareous loess. Soils formed in loess include the Amsterdam, Bigbear, Blackdog, Brocko, Danvers, Kelstrup, and Quagle series. Some soils formed in recent alluvium are the Attewan, Beaverell, Beaverton, Beavwan, Chinook, Hyalite, Kalsted, and Turner series.

The mountains and bedrock-controlled hills may have soils formed in one of the following parent materials: limestone, gneiss and schist, quartzite, argillite, sandstone, shale, or igneous volcanics. A single parent material under the influence of varying precipitation amounts exhibits marked changes in soil development. Generally silty soils that formed in loess, such as Blackmore and Brocko soils, are examples of this principle. Other examples are generally loamy and high in rock fragment content and formed in limestone, such as Crago and Hanson. Generally sandy soils formed from gneiss and schist, such as Barbarela and Nuley soils, and generally clayey soils are found in shale, such as Bangtail and Tanna soils. Many of the soils in the survey area have accumulated lime from the parent material. The presence, depth, and amount of lime varies with parent materials and amount of precipitation in the specific area. The majority of soils within the county are slightly basic, above 7.0, with values typically around 7.8 to 8.2.

Wind erosion is a concern along the western side of the county due to the type of soil, lack of rainfall and types of crops grown, specifically prior to planting potatoes when the soil is largely barren in the spring due to the soil preparation necessary for a successful crop. Organic matter depletion has occurred across most of the annually cropped fields as a result of traditional farming practices that disturbed the soil, limited the amount of surface residue and reduced the amount of time living roots are in the soil. Reduced levels of organic matter in the soil have important negative repercussions related to water holding capacity and fertility of the soil resource.

Water erosion is a concern as well, although most erosion occurs within a field and soil is not moved off site. Early spring typically has the most water erosion due to more rainfall and less residue cover to protect the soil. Seeding these areas into permanent vegetative cover, i.e. grassed waterways, could drastically reduce the amount of water erosion occurring within Gallatin County. It is critical to provide residue cover following potatoes to reduce erosion. From a producer standpoint this may not seem practical, but a winter cover crop can help to reduce erosion Many producers will prepare their fields for potatoes by hilling the field in the fall and planting in the spring when soil temperatures reach 55 degrees Fahrenheit. Unfortunately, the soil is typically more susceptible to water and wind erosion early in the spring. Therefore, delaying hilling until spring and seeding quickly behind the hilling operation may reduce the amount of time the soil is exposed, thereby reducing the potential for erosion.

Prime Farmland and Other Important Farmland in Gallatin Valley

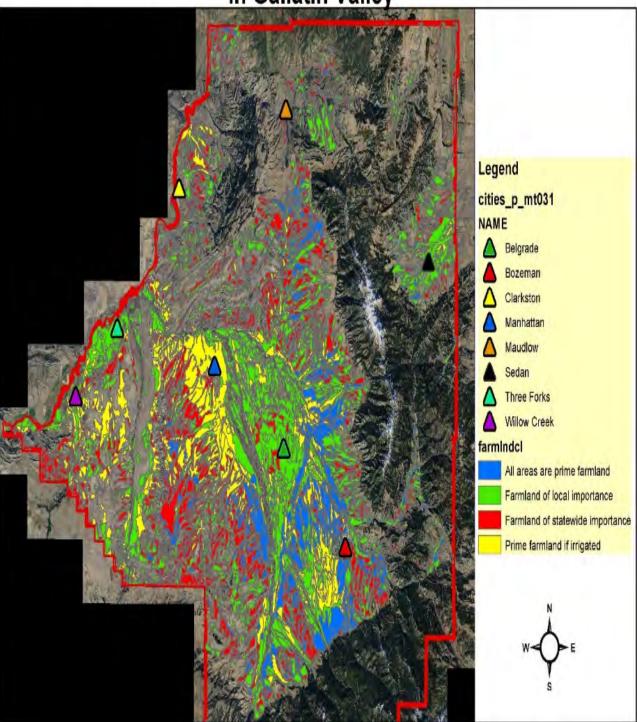


Figure 8; Prime Farmland and other important farmland in Gallatin Valley

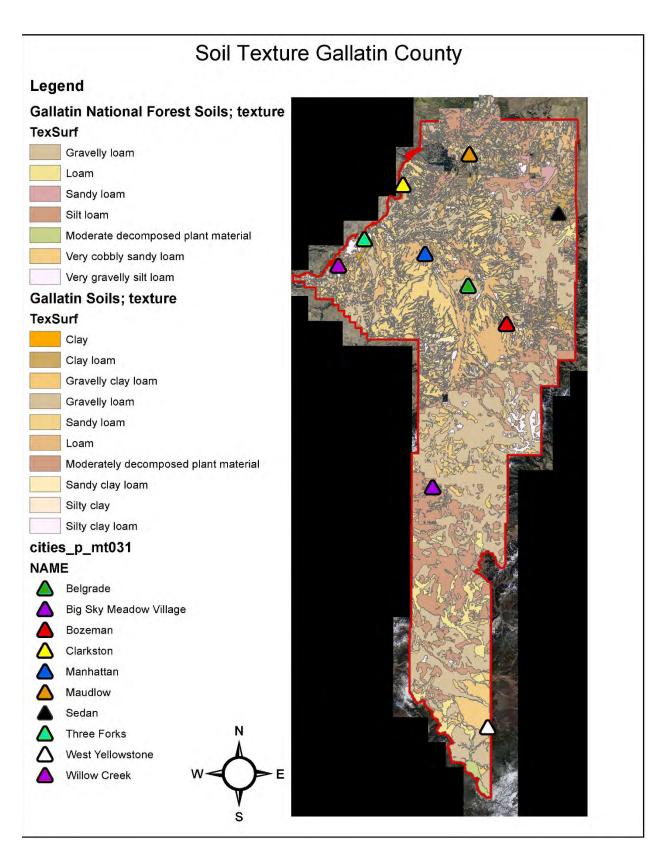


Figure 9; Soil Texture in Gallatin County

D. Resource Concern-Water

The free-flowing Gallatin River originates at Gallatin Lake in Yellowstone National Park at an elevation of 8,834 ft. It flows north for 115 miles to Three Forks, Montana, where it joins the Madison and Jefferson Rivers to form the Missouri River. From the Park boundary, the river flows about 44 miles through the narrow Gallatin Canyon, and then enters the broad Gallatin Valley, where it flows an additional 45 miles to its mouth. Much of the Gallatin River is classified "Blue Ribbon" by Montana Fish, Wildlife and Parks (FWP) in recognition of its high recreational, fishery, and aesthetic values (Figure 9). The west Gallatin River, which flows out of Yellowstone national park, then north through Gallatin Canyon, provides most of the water for irrigation within Gallatin County. The east Gallatin River, originating on Bozeman pass (divide between Gallatin and Park counties) and the Bear Creek area south and east of Bozeman along with other smaller streams provide additional opportunities for irrigation throughout the county. Along the east border of the county drainage flows down into Park County and the Yellowstone River.

In a typical year, most western Montana's precipitation falls as winter snow (62-65%) of the total annual precipitation (Serreze et al. 1999), consequently snowpack is the main driver of water resources in Gallatin County.

There are 33 natural lakes and reservoirs in the Gallatin River drainage, totaling 434 surface acres. Most natural lakes are mountain lakes in the headwaters of the Gallatin River. The largest reservoir in the drainage is Hyalite Reservoir south of Bozeman, which together with Bozeman Creek and Lyman spring supply Bozeman's, Gallatin Counties largest town, drinking water. Lowland lakes in the valley bottom support urban fisheries which consist of rainbow trout, brown trout and illegally introduced warm water fish of various species. High mountain lake fisheries are either stocked on a regular basis or contain self-supporting populations of westslope cutthroat trout, brook trout, golden trout, or arctic grayling.

FISHERIES MANAGEMENT

The Gallatin drainage is home to a variety of native fish species including mountain whitefish, longnose dace, longnose suckers, Rocky Mountain sculpin, mountain sucker, white sucker, and westslope cutthroat trout. Several nonnative fish species are also found in the drainage and include brown trout, brook trout, rainbow trout and Yellowstone cutthroat trout. Most streams in the drainage are managed for nonnative self-sustaining wild trout fisheries. These trout populations are currently stable from year to year. Only one pure population of native westslope cutthroat trout exists in the drainage. Hybridized (westslope cutthroat with rainbow trout) populations exist in a few headwaters streams.

A decline in westslope and Yellowstone cutthroat trout numbers has occurred during the past several decades due primarily to invasive species, habitat alteration and changes in climate. Stream flow alterations have occurred throughout the county and has resulted in some habitat degradation leading to dewatering critical habitats, stream alterations and decreased low flows during critical times.

The U.S. Fish and Wildlife Service's Bozeman National Fish Hatchery was established in 1892 for production and stocking of trout in Montana and surrounding states. In 1983 the facility was designated as a Fish Technology Center to conduct research and provide technical assistance on a number of aquatic resource issues, such as whirling disease.

The Gallatin River drainage is also home to several conservation populations of westslope cutthroat trout providing opportunities to conserve this native species in the drainage. The long-term goal of cutthroat conservation in the Gallatin River drainage is to have approximately 20% of the historically occupied habitat restored to secure conservation populations of cutthroat trout.

SPECIAL MANAGEMENT ISSUES

Gallatin County is a closed basin to appropriate water with some exceptions, mainly related to residential development. A number of ground water studies and geologic mapping activities have occurred within the county over the years and are continuing around the Belgrade, Manhattan and Big Sky areas. Due to the valley's size and the complexity of the deposits of sediments within the valley boundary there is not a single aquifer but more of an aquifer system (Evaluation of Potential High-yield groundwater development in the Gallatin Valley, Gallatin County, Montana; Montana Bureau of Mines and Geology, File report 698).

Hyalite Reservoir, Lyman Spring and Bozeman Creek provide municipal water for the City of Bozeman. Expansion of the human population in Bozeman and the surrounding area has caused concern over the ability of existing sources (primarily Hyalite Reservoir) to satisfy municipal demand of water. Possible solutions include the development of additional water storage for municipal use, diverting some irrigation water and injecting into ground water for later use, along with a number of other ideas are currently being discussed

Waterbodies in Gallatin County

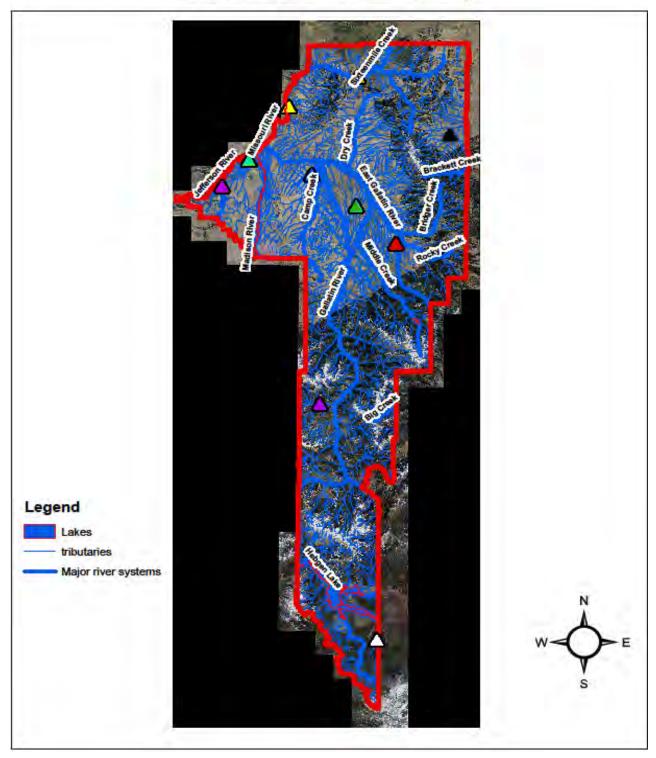


Figure 10; Waterbodies in Gallatin County

Fifteen separate streams were listed as impaired by the Montana Department of Environmental Quality as not meeting state water quality standards (see Appendix C). These streams are considered "impaired" because they contain sediment, nutrients and or E. coli at levels that impair the use of that water for beneficial purposes such as irrigation or recreation. Implementation of a surface water monitoring program from which data can be used to evaluate the status and long-term trends in water quality within Gallatin County would help to target conservation efforts to improve water quality.

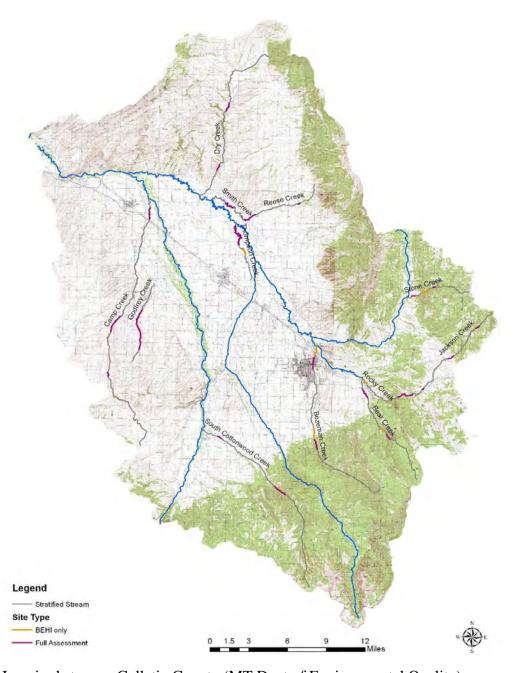


Figure 11; Impaired streams Gallatin County (MT Dept of Environmental Quality)

Irrigation

With over 62 named diches and canals, water conveyance in Gallatin County is vital to agriculture and groundwater/aquifer recharge. The complete picture of how surface water (canals, ditches) influences groundwater and where this occurs is less well known. Canals and ditches divert water from the West and East Gallatin River, Bozeman Creek and Hyalite reservoir. The Jefferson and Missouri rivers form the northwest boundary of Gallatin County, with Sand Creek and Willow Creek contributing irrigation water on the western boundary of the county. Sixteen Mile Creek contributes a small amount of irrigation water in the northeastern portion of the county with Flathead Creek providing some irrigation water to Gallatin County along the east slope of the Bridger Mountain Range. Some of these canals were in place prior to Montana becoming a state. A number of irrigation canals are shut down due to low flows in the Gallatin River after runoff and are considered to be "flood rights". Water storage for late season irrigation is lacking within the county.

E. Resource Concern-Animals

Domestic Animals

With approximately 50,000 cows and calves in the county (from Montana Agricultural Statistics, 2018) and a growing residential base with land development at an all time high there is a shortage of available summer pasture. Additionally, locating suitable winter feeding or animal confinement areas for livestock is a challenge in Gallatin County, given the severity of winters and amount of snowfall. Winter feeding areas in riparian areas, specifically along the west fork of the Gallatin River is an issue given the amount of potential runoff from these fields adjacent to the Gallatin River. Finding suitable winter-feeding areas that provide shelter and ease of access for providing hay is critical to alleviating the input of manure into waterways from riparian pastures that are utilized for winter feeding. Calving in late winter can be risky given the amount of snow, cold temperatures, lack of shelter and reliance on hay. Alternatively, calving later in the spring has shown that for similar pregnancies, calving, weaning rates, post weaning average daily gains, higher birth weights and a tighter calving period make this a viable alternative to late winter or very early spring calving. (Pang et al. 1998). Sheep production at approximately 1900 animals is also under strain to find enough pasture to effectively graze animals through the growing season. Gallatin County ranks number 1 for the number of horses with over 6,288 in Montana

(https://www.nass.usda.gov/Publications/AgCensus/2012/Online_Resources/County_Profiles/M ontana/cp30031.pdf) and has a small acreage overgrazing issue related to pasturing horses. Small acreage landowner education was identified during both the 2016 and 2019 local working group meetings as an important tool to address resource concerns on smaller acreage properties.

Livestock water is an issue in certain areas around the county especially in the Dry Creek area. There are fewer perennial streams in this area and as a result, animals generally travel a fair amount to gain access to water. Also, the Dry Creek area tends to receive less rainfall than some other areas of the county, (see county precipitation map; figure 2). Additionally, there are several larger ranches and cattle operations in this portion of the county with acreages that could

benefit from additional watering facilities and cross fencing to more evenly distributing grazing across the landscape while maintain the integrity of the few perennial streams that are found in this area. Another benefit of additional livestock water in these areas is that the land could be more effectively managed to be more resilient to weed infestation.

Wildlife

There are 53 animal Species of Concern in Gallatin County with 10 mammals, 29 bird species, 1 reptile, 1 amphibian, 2 fish species and 10 invertebrate species with 6 insects and 4 mollusk species (See appendix E). The Species of Concern list is produced jointly by the Montana Natural Heritage Program and Montana Department of Fish, Wildlife and Parks. Species of Concern are native Montana animals that are considered to be "at risk" due to declining population trends, threats to their habitats and restricted distribution. Status determinations are made by Montana Natural Heritage Program and Montana Fish, Wildlife and Park biologists in consultation with representatives of the Montana Chapter of the Wildlife Society, the Montana Chapter of the American Fisheries Society and other experts. The U.S. Fish and Wildlife Service has two species listed as threatened in Gallatin County, the Canada lynx and grizzly bear, and one species proposed to be listed, the wolverine. The Canada lynx, grizzly bear, and wolverine are also included in the Species of Concern list. Actions taken within potential lynx habitat undergo additional scrutiny and are subjected to additional limitations based on consultation with the U.S. Fish and Wildlife Service.

Grizzly bears are present in Gallatin County, with the majority occurring south of the I-90 interstate corridor. Wolves and bison are also present in Gallatin County. Wolves are present mainly on National Forest land although a pack is thought to be present on private land that runs across the southwest corner of the county and is adjacent to the National Forest. There have been reports of calf losses due to wolf predation around Willow Creek and a number of producers have had to adjust their grazing rotations to better protect calves. Bison and elk are another concern within the county due to their ability to transmit brucellosis, a disease that causes cattle to abort their calves. Wild bison are generally present in the West Yellowstone area and are not in direct competition with cattle for grazing. Elk, however are more widespread throughout the county and are known to carry brucellosis, and as a result all cattle producers with female cattle or domestic bison must vaccinate against brucellosis.

The increasing size of elk herds in the county have led to some negative consequences for producers, specifically with maintaining fences. Elk have been more prevalent in the valley than in years past, especially during the fall and winter, which has negatively impacted some producers along the valley fringes where hay stacks and other stockpiled forage for domestic animals have been impacted by elk.

Mountain lions are also present in Gallatin County, with the largest population in the Bridger Mountains, just north and east of town, although there have been very limited interactions between the animal and humans to date.

A number of conservation measures specifically for wildlife might include: converting marginal cropland to perennial vegetation, utilizing wildlife friendly fences in wildlife corridors, increasing pollinator plantings, prescribed grazing and providing off stream watering facilities.

F. Resource Concern-Air

Clean air is important not only to support life but also because it contributes to clean water, healthy fisheries, soils and ecosystems in general. Air quality, in Gallatin County, is monitored and regulated by the Montana Department of Environmental Quality (MTDEQ) as required by the Environmental Protection Agency and the Clean Air Act. The Gallatin City-County Health Services offers information and educational support to the community on some air quality issues. Typically, Gallatin County has good air quality. Poor air quality in Gallatin County is generally associated with forest fires, although there are times when field burning has been an issue in the past. Generally, field burning is no longer practiced except in a few cases when producers are concerned by the amount of residue in the field. Prescribed burning in forests and rangelands must be managed to coincide with conditions within the county and adjacent counties to minimize negative effects related to air quality.

G. Resource Concerns-Energy

Agricultural energy consumption includes energy needed to grow and harvest crops and energy needed to grow livestock. Crop operations consume much more energy than livestock operations, and energy expenditures for crops account for a higher percentage of farm operating costs.

Energy consumption includes both direct and indirect costs such as the production and transport of fertilizer. This report will focus mainly on the direct energy costs of operating an agricultural operation in Gallatin County, Montana.

Fuel is the major costs related to direct energy consumption on farm. In addition to operating tractors in the field, fuel is also necessary to get crops to market. Another major energy cost is related to supplying water to fields, which is largely accomplished by utilizing electricity to pump water.

Reducing tillage operations, which have been shown to increase some of the benefits related to soil health also reduces direct fuel costs. Some of the lower costs associated with reduced tillage, however, may be displaced by the increased costs of chemical applications necessary to reduce weeds. Utilizing gravity to supply irrigation water to fields is another avenue for farmers and ranchers to employ in order to reduce energy costs, however, not all operations have the potential for gravity assisted production

V. Conservation Activity Analysis

In 2015 a Gallatin County local working group meeting was convened at the Conservation District office in Manhattan, MT. Multiple maps were displayed with 9 ten-digit hydrologic watersheds represented. Since the southern half of the county is largely federal land, the area of interest was focused on the northern portion of the county. The two top resource concerns were identified for each watershed. An initial discussion and vote determined to address resource

concerns by watershed not by land use. However, for cropland, soil quality degradation was identified as the top resource concern with the greater Camp Creek/Godfrey Creek watershed identified as the primary watershed.

Bridger Creek Watershed

- 1. Human-urban sprawl (water treatment/water quality)
- 2. Soil erosion-shoreline, bank and channel erosion

Camp Creek Watershed

- 1. Soil erosion-shoreline, bank and channel erosion
- 2. Excess/insufficient Water-Inefficient use of irrigation water (infrastructure)

Dry Creek Watershed

- 1. Soil erosion-shoreline, bank and channel erosion
- 2. Animal-feed and forage

Gallatin River-Gallatin Gateway Watershed

- 1. Human-urban sprawl (small acre education)
- 2. Excess/insufficient Water-Inefficient use of irrigation water (infrastructure)

Hyalite Creek Watershed

- 1. Human-urban sprawl (small acre education/changing landuse)
- 2. Excess/insufficient Water-Inefficient use of irrigation water (infrastructure)

Lower East Gallatin River Watershed

- 1. Human-urban sprawl (small acre education/changing landuse)
- 2. Water Quality Degradation-(Nutrients, sediment & temperatures)

Lower Gallatin Watershed

- 1. Excess/insufficient Water-Inefficient use of irrigation water (infrastructure)
- 2. Plant health- (Plant productivity and health/structure and composition

Smith Creek Watershed

- 1. Excess/insufficient Water-Inefficient use of irrigation water (infrastructure)
- 2. Human-urban sprawl (small acre education)

Upper East Gallatin River Watershed

- 1. Human-urban sprawl (water treatment/water quality)
- 2. Soil erosion-shoreline, bank and channel erosion

In 2019 another local working group meeting was convened at the conservation district office in Manhattan, MT. Participants of the LWG were the Natural Resources Conservation Service, Gallatin Agricultural Irrigators, Gallatin Valley Land Trust, Trout Unlimited, Conservation District, Montana Land Reliance, Department of Natural Resources, Gallatin Invasive species alliance, Gallatin County weed district, Montana State University extension, Farm Service Agency, Gallatin River Task force, Greater Gallatin Watershed Council, Trust for Public Lands, Gallatin Local Water Quality district, U.S. Forest Service, Greater Yellowstone Coalition, Stockman bank, Pheasants Forever and some local producers.

Initial discussion focused on the purpose of a long range plan and how the targeted implementation plans will come out of the long range plan. Each group was given the opportunity to discuss some of their accomplishments addressing natural resource concerns in the county.

The 2019 local working group discussed the 2016 local working group meeting and the results of that meeting where Camp and Godfrey Creeks were designated as the priority one watersheds for Gallatin County. Briefly discussed the strategy of planning by watershed versus land use or some other alternative.

The 2019 local working group reviewed the forest health Targeted Implementation Plan for the group as an example of how NRCS will be targeting specific resource concerns in particular locations.

The 2019 local working group reviewed resource concerns and discussed potential opportunities for collaborating on projects.

The 2019 local working group went through each watershed and listed resource concerns, participants then ranked the resource concerns throughout the county.

Camp creek

- 1. Soil erosion; excessive bank erosion
- 2. Water Quantity; inefficient use of irrigation water

Lower Gallatin

- 1. Water Quantity; Inefficient use of irrigation water
- 2. Plant Productivity; weeds

Lower East Gallatin

- 1. Human; urban sprawl; education for small landowners
- 2. Water Quality; sediment, temperature, nutrients

Gallatin River/Gallatin Gateway

- 1. Urban Sprawl; land use change, small acre education
- 2. Water Quantity; inefficient use of irrigation water/flooding/spring runoff

Madison River/Three Forks/Willow Creek

- 1. Water Quantity
- 2. Streambank Erosion

Missouri River Headwaters

- 1. Water Quantity; flooding
- 2. Urban Sprawl

Flathead Creek

- 1. Forest Health
- 2. Plant health and productivity; weeds

Sixteen mile creek

1. Weeds

Dry Creek

- 1. Soil erosion; streambank, wind
- 2. Animal; inadequate feed and forage

Smith Creek

- 1. Water Quantity; inefficient use of irrigation water
- 2. Urban Sprawl; small acre education

Bridger Creek/Upper East Gallatin River

- 1. Urban sprawl
- 2. Soil erosion; streambank

Hyalite Creek

- 1. Urban Sprawl; land use change
- 2. Water Quantity; urban use of water rights/inefficient use of irrigation water

Since 2015, three national programs were funded within Gallatin County in addition to the Bozeman area EQIP funds, these programs include the RCPP (Regional Conservation Partnership Program), NWQI (National Water Quality Initiative) and the Missouri Headwaters Drought Resilience program.

Regional Conservation Partnership Program RCPP

A partnership of agricultural and conservation groups in the Gallatin Valley of Montana was approved for \$3.7M in funding through the Regional Conservation Partnership Program (RCPP) of the Natural Resource Conservation Service (NRCS) in 2015. This program creates a special 5-year funding pool for conservation projects in the Gallatin Valley and promotes coordination between NRCS and local partners to deliver conservation assistance to producers and landowners. The funding was used for two purposes:

- 1. To compensate landowners for conservation easements on important agricultural properties; (\$3.2 Million); to date the RCPP program has accomplished the following
 - 7 ACEP/ALE Conservation Easements that protected 2602 acres of prime and significant farmlands
 - 13 other conservation easement projects were funded within the region's boundary from other funding sources that protected an additional 5391 acres of prime and significant farmlands
 - Total RCPP dollars spent plus match and other local cash sources resulted in nearly \$28 million in conservation spending within the RCPP boundary
- 2. The RCPP award also went to implement farming and ranching practices that protect and enhance water quality, soil health and water quantity (\$500,000).

- EQIP project, 2016; Obstruction removal, water gap, fencing, weed control, irrigation water management, irrigation infrastructure improvements, energy efficiency improvements (pumps)
- EQIP project, 2017; Irrigation water management, irrigation infrastructure improvements, nutrient management, energy efficiency improvements (pumps)
- EQIP project, 2019; Cover crops, pollinator friendly planting

RCPP - Geographic Focus

The project area includes the entire Gallatin Valley (see map below). Within this larger region, projects were prioritized that:

- Adjoin or are close to designated "impaired water bodies" (especially Camp Creek, the East Gallatin River and their tributaries)
- Are adjacent to or on protected lands (private conserved lands or public lands)
- Have prime, important or unique agricultural soils.

The RCPP program has allowed the project partners to address rapid land use conversion and urban sprawl through the acquisition of conservation easements that protect private farmlands from subdivision and development.

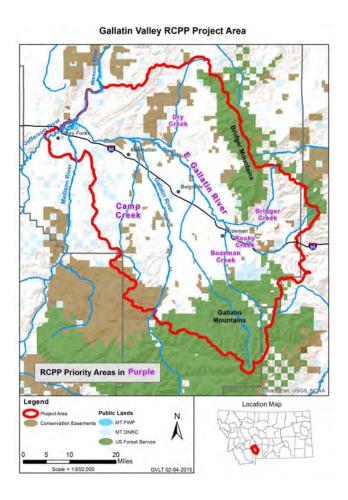


Figure 12; RCPP boundary

Headwaters Drought Initiative

The USDA Natural Resources Conservation Service (NRCS) offered a localized initiative addressing water conservation and drought resiliency in the Missouri Headwaters Basin of Southwestern Montana. NRCS worked with landowners in the Missouri Headwaters Basin to increase water conservation; improve riparian, floodplain, and water management; and promote upland management conservation to help mitigate the effects of drought. Here are the projects that were completed through the initiative:

- EQIP projects 2016; \$700,000 obligated; prescribed grazing, fence, water gap, irrigation infrastructure improvements, seeding highly erodible land (HEL) ground to permanent grass, animal confinement relocation, energy efficiency improvements (pumps), cover crops, Irrigation water management, tree and shrub establishment
- EQIP projects 2017; \$185,000 obligated; Forest stand improvement, woody residue treatment, herbaceous weed control, irrigation infrastructure improvements, energy efficiency improvements (pumps), no-till, weed control, seeding HEL cropland to permanent grass.

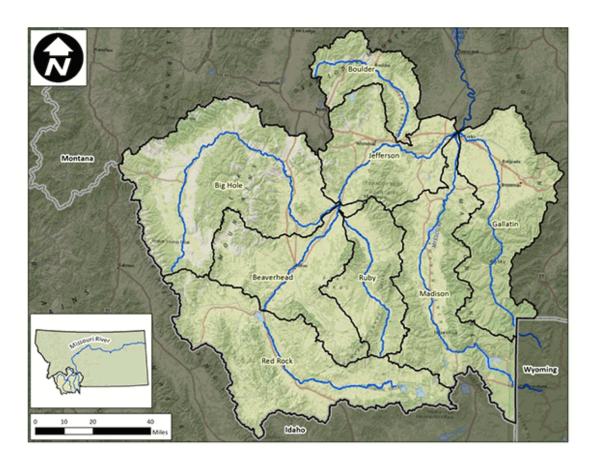


Figure 13; Headwaters Drought project area

National Water Quality Initiative (NWQI)

The National Water Quality Initiative is a partnership among NRCS, state water quality agencies and the U.S. Environmental Protection Agency to identify and address impaired water bodies through voluntary conservation. NRCS provides targeted funding for financial and technical assistance in small watersheds most in need and where farmers can use conservation practices to make a difference. Here are the projects that were completed through this initiative:

- EQIP 2017; \$595,271 obligated; Animal confinement relocation, fence, irrigation water management, irrigation infrastructure improvements, nutrient management, energy efficiency improvements (pumps), cover crops, watering facility, livestock pipelines, and prescribed grazing
- EQIP 2018; \$710,014 obligated; Well, watering facility, irrigation water management, irrigation infrastructure improvements, fence, energy efficiency improvements (pumps), cover crops, seeding HEL cropland back to grass, tree and shrub establishment, and weed control
- EQIP 2019; \$1,080,013 obligated; Irrigation infrastructure improvements, energy efficiency improvements (pumps), cover crops, irrigation water management, weed control, and seeding HEL cropland back to grass.

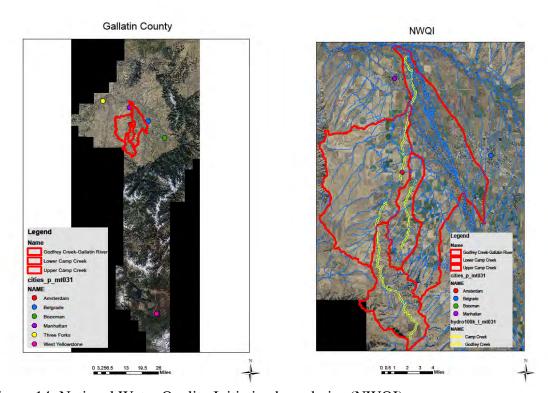


Figure 14; National Water Quality Initiative boundaries (NWQI)

The NRCS in Gallatin county plans to work cooperatively with others to promote and encourage conservation, with past partners that include:

- Gallatin Valley Land Trust (GVLT)
- Association of Gallatin Agricultural irrigators
- Gallatin Conservation District
- Montana State University Extension
- Gallatin National Forest
- Gallatin Local Water Quality District
- City of Bozeman
- Montana Department of Natural Resources and Conservation
- Montana Fish, Wildlife & Parks
- Montana Land Reliance
- Trout Unlimited
- The Trust for Public Land
- Gallatin County
- Greater Gallatin Watershed Council
- Pheasants Forever

VI. Prioritization of Natural Resource Problems and Desired Future Outcomes

The Gallatin County Local Working Group met in April of 2019 and in 2015 to discuss and prioritize Gallatin County resource concerns. The group prioritized Gallatin County resource concerns based on a watershed approach. The watershed approach allowed participants to identify specific resource concerns based on the local conditions within the watershed (see attached local working group minutes from 2015 and 2019), which dovetails nicely with the focused conservation strategy related to the targeted implementation plans. The county was divided into 12 distinct watersheds. The following resource concerns were identified in the 12 watersheds as one of two priority resource concerns for each watershed, the Dry Creek watershed only had one resource concern identified during the local working group meetings.

A. *Water Quantity*; was identified in 66% of the watersheds as a priority resource concern. The NRCS continues to support projects that increase irrigation efficiency through both the existing NWQI program and through the RCPP program. Future TIPs will be proposed to further increase irrigation efficiency where possible.

Partner contribution; The Greater Gallatin Watershed Council, Trout Unlimited, Gallatin Local Water Quality district, Gallatin County Conservation District, Association of Gallatin agricultural irrigators, Gallatin River Task Force, among others, are willing agencies and organizations to partner with the NRCS to improve water quantity.

Success will be measured by stream flows and length of irrigation season. When irrigation efficiency increases more water should remain in streams and irrigators should be able to irrigate later in the season given the increased duration of adequate stream flow.

B. *Urban Sprawl*; was identified in 50% of the watersheds as a priority resource concern. The Regional Conservation Partnership Program (RCPP) with the Gallatin Valley Land Trust (GVLT) has been extended for another year with an additional renewal approved for future funding. NRCS will continue to support the funding of this program to protect prime farmland from development, with cost share available to applicants within this program.

Partner contributions; GVLT and the Montana Land reliance along with NRCS easement programs continue to protect land from development on prime soils or on working farms. In 2019 Gallatin Valley Land Trust renewed their RCPP program for another 5 years within Gallatin County to protect land with prime soils from development. In 2018, Gallatin County approved 20 million dollars for an open lands bond to purchase development rights so that working farms and ranches remain in agriculture.

Success; Farming will continue in the county

C. *Soil Erosion*; was identified in 33% of the watersheds as a priority resource concern. Soil erosion, whether it is wind or water induced is and has traditionally been a focus of the NRCS. Highly erodible land conservation plans are developed as requested by the Farm Service Agency (FSA) to address wind and water erosion on land that has not had a land determination. Additionally, multiple practices including but not limited to cover crops and residue management have greatly reduced soil erosion in the county and are available through all programs and technical assistance. There, however, is a period prior to planting and just after harvest on potato ground that is susceptible to soil erosion. A TIP is in development to address these critical periods during soil preparation and after harvest for potato fields.

Partner contributions; the Gallatin agricultural irrigators, GVLT, Gallatin county extension, Gallatin county conservation district, producers, Montana Land Reliance and others continue to provide education and outreach to landowners related to reducing erosion.

Success; Reduced sediment loading in streams with the possible removal of sediment from list of impairments on a number of impaired streams within the county. Elimination of dust storms in fall and spring. Reduced washing in fields during spring runoff.

D. *Plant Productivity*; specifically weeds, were identified in 25% of the watersheds as a priority resource concern. Ventenata, recently identified in Gallatin County is a highly invasive grass species that has recently raised alarms through much of the west given that it is beginning to replace perennial grasses while having minimal forage value for livestock or wildlife. Other weeds, such as Canada thistle, Russian thistle, knapweed and leafy spurge are present and efforts are continuing to address these plants, largely on pastureland and rangeland settings.

Partner contributions; Gallatin County Weed District, Montana State University, Gallatin County Invasive Species Alliance, Gallatin County Extension, Gallatin County Conservation District,

other federal and state agencies, along with others will continue to educate, supply cost share, identify and map invasive weeds within the county.

Success; Reduction of weeds present on private and public land within the county will be difficult given the amount of development and traffic on waterways and roads. However, given the quality of mapping from Montana State University and the Gallatin County Weed District we can target new infestations prior to them becoming established on the landscape if identified early. Raising awareness with landowners on the cost of weed infestation, such as reduced biodiversity, decreased production, nutrient depletion, shading desirable species and water use may increase the amount of acres treated for weeds.

E. Forest Health; was identified in only 10% of the watersheds but forest are not present in most watersheds. A TIP was submitted to address fuel loading on private forested land within the Bridger Mountain/Bangtail Mountains to coincide with a United States Forest Service project that is currently ongoing within this area on public land. A future TIP or Two Chiefs proposal will address forest health in the North Gallatin range, the location of the water supply for the City of Bozeman.

Partner contributions; the USFS is currently conducting a fuels reduction project in the Bridger mountain range. Montana Extension has completed a number of outreach events throughout the county to educate the public about fuels reduction and fire safety as it relates to property ownership. The City of Bozeman is also involved in forest health education as they work to thin some trees on city land within the city water supply basin (Sourdough area of the north Gallatin Range) to reduce the risk of a catastrophic fire that would negatively impact the City's ability to provide safe drinking water to the City of Bozeman.

Success; Reduce excessive fuel loading on forested land.

F. Animal health, specifically, inadequate feed and forage, was identified in approximately 10% of the watersheds as a priority resource concern. The loss of adequate pastureland and rangeland due to land development has been a serious concern in the county. Land development and urban sprawl continue to reduce the amount of open space available for livestock grazing. Consequently, the remaining undeveloped pasture and rangeland tend to be overstocked given the lack of available grazingland to graze livestock. Easement programs through the NRCS continue to be utilized to protect some of these areas from development. Some marginal cropland has been seeded back to grass and the adoption of cover crops, especially in place of fallow, has reduced some of the grazing pressure on the remaining pasture and rangeland.

Partner contributions; Gallatin Valley Land Trust and Montana Land Reliance along with Gallatin County have protected many acres in Gallatin County from development. The Gallatin Conservation district along with others have promoted the easement program with the goal of protecting agriculture in the Gallatin Valley.

Success; Success may be measured by the number of medium to large agricultural operations within the county and the quality and quantity of livestock shipped to market.

Gallatin County; Applied Conservation 2008-2018

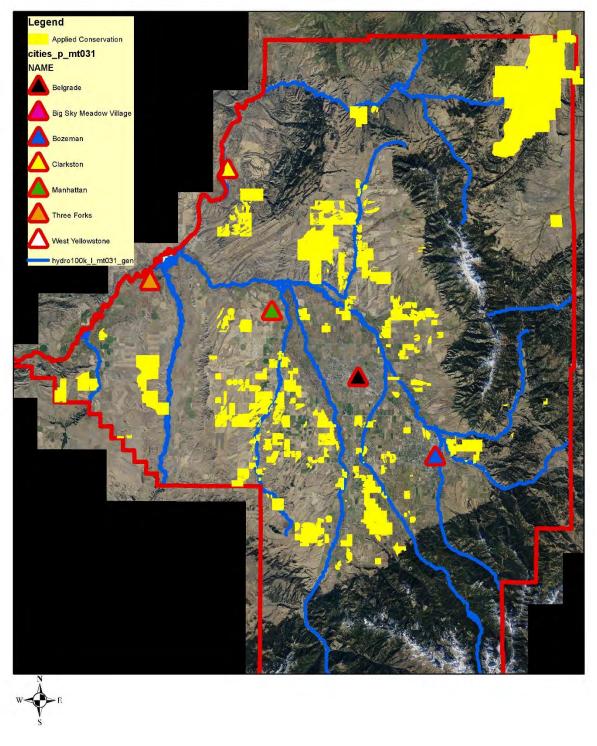


Figure 15; Applied Conservation, Gallatin County

Appendix A: 2015 Local Working group meeting minutes

Gallatin County Local Working Group Gallatin Conservation District Meeting Room 120 S 5th Street Ste B102, Manhattan February 19, 2015, 2:30 p.m.

The meeting was convened by John Venhuizen, Chairman of the Gallatin Conservation District, at 2:30 pm. He called for a role call then turned the meeting over to Justin Meissner who facilitated the meeting.

Those in attendance were John Venhuizen, John Schutter, Sherwin Leap, Jason Camp, Bill Wright – Gallatin Conservation District; Marcie Murnion- GCD Administrator; Peter Brown-Gallatin Valley Land Trust; Walt Sales -Association of Gallatin Agricultural Irrigators; Brad Bauer-MSU Extension; Keri Bilbo -NRCS Bozeman Area ASTC-FO; Kale Gullett-NRCS State Resource Conservationist; Justin Meissner-NRCS District Conservationist; Maureen Meagher-NRCS District Resource Conservationist; Chris Mahony-NRCS Soil Conservationist; Marvin Hansen-NRCS Soil Conservation Technician; Susan Duncan-Upper Creamer Ditch; Marcia Youngman-Greater Gallatin Watershed Council; Michael Bertrand-CD Staff.

Justin provided instructions on what the purpose of the LWG was and that all entities were allowed one voting representative with the exception of the conservation district where each supervisor was allowed to vote independently as the each represent a portion of Gallatin County.

Multiple maps were displayed showing the 10 digit Hydrologic Unit Codes overlaying the 2013 aerial photo of Gallatin County. Due to the southern half of Gallatin County being dominated by federal land the area of interest was focused on the northern portion of the county.

Discussion was led on identifying the top two resource concerns for the nine 10 Digit HUC watersheds that lie within the Gallatin Valley RCPP boundary, (Bridger Creek (44,142 acres), Camp Creek (47,591 acres), Dry Creek (67,535 acres), Gallatin River-Gallatin Gateway (131,445 acres), Hyalie Creek (69,359 acres), Lower East Gallatin River (78,975 acres), Lower Gallatin River (66,727 acres), and Smith Creek (54,312 acres), Upper Ease Gallatin River (96,804 acres).

Bridger Creek Watershed

- 1) Human- Urban Sprawl (water treatment / water quality)
- 2) Soil Erosion Shoreline, Bank and Channel Erosion

Camp Creek Watershed

- 1) Soil Erosion Shoreline, Bank and Channel Erosion
- 2) Excess/Insufficient Water Inefficient Use of Irrigation Water (Infrastructure)

Dry Creek Watershed

- 1) Soil Erosion Shoreline, Bank and Channel Erosion
- 2) Animal –Feed and Forage

Gallatin River-Gallatin Gateway Watershed

- 1) Human Urban Sprawl (Small Acre Education)
- 2) Excess / Insufficient Water 0Inefficient Use of Irrigation Water (Infrastructure)

Hyalite Creek Watershed

- 1) Human Urban Sprawl Human (Small Acre Education / Changing Landuse)
- 2) Excess / Insufficient Water 0Inefficient Use of Irrigation Water (*Infrastructure*)

Lower East Gallatin River Watershed

- 1) Human Urban Sprawl Human (Small Acre Education / Changing Landuse)
- 2) Water Quality Degradation (*Nutrients, sediment & temperatures*)

Lower Gallatin Watershed

- 1) Excess / Insufficient Water OInefficient Use of Irrigation Water (*Infrastructure*)
- 2) Plant Health (*Plant productivity and Health / Structure and Composition*)

Smith Creek Watershed

- 1) Excess / Insufficient Water (Insufficient Use of Irrigation Water (*Infrastructure*)
- 2) Human Urban Sprawl (Small Acre Education)

Upper East Gallatin River Watershed

- 1) Human- Urban Sprawl (water treatment / water quality)
- 2) Soil Erosion Shoreline, Bank and Channel Erosion

** Note ** All watersheds where Excess /Insufficient Water / irrigation infrastructure was documented as a primary resource concern, ENERGY was also noted specifically for Irrigation Pumps and potential for re-organization **

After detailed conversations on all watersheds the following was brought to the group for a unanimous decision:

- 1) Primary One Resource Concern (County Wide): None Identified
- 2) Land Use (Cropland- Soil Quality Degradation)
- 3) Watershed (greater Camp Creek Watershed includes Godfrey Creek) All Land uses All Resource Concerns.

The initial vote was 4 for watershed and 4 for land use. After polling the voting members for their reasons for their vote a second vote was take with a consensus towards identifying the

primary one watershed as the greater camp Creek Watershed for the 2016 Gallatin County Local Working Group Recommendation.

The LWG was adjourned by the Chairman Venhuizen.

Appendix B: 2019 Local Working Group Minutes

4/3/2019 Local Working Group Minutes

Present

Natural Resources Conservation Service, Gallatin Agricultural Irrigators, Gallatin Valley Land Trust, Trout Unlimited, Conservation district, Montana Land Reliance, Department of Natural Resources, Gallatin Invasive species alliance, Gallatin County weed district, Montana State University extension, Farm Service Agency, Gallatin River Task force, Greater Gallatin Watershed Council, Trust for Public Lands, Gallatin Local Water Quality district, U.S. Forest Service, Greater Yellowstone Coalition, Stockman bank, Pheasants Forever and some local producers.

Initial discussion focused on the purpose of a long range plan and how the targeted implementation plans come out of the long range plan. New way of doing business for NRCS, targeting areas for specific resource concerns. Each group was given the opportunity to discuss some of their accomplishments addressing natural resource concerns in the county.

Discussed the 2016 local working group meeting and the results of that meeting where Camp and Godfrey creek were designated as the priority one watersheds for Gallatin County. Briefly discussed the strategy of planning by watershed versus land use or some other alternative.

Reviewed the forest health tip for the group as an example of how NRCS will be targeting resource concerns in particular locations.

Reviewed resource concerns and discussed potential opportunities for collaborating on projects.

Went through each watershed and listed resource concerns, participants than ranked the resource concerns though out the county.

Camp creek

- 3. Soil erosion; excessive bank erosion
- 4. Water Quantity; inefficient use of irrigation water

Lower Gallatin

- 3. Water Quantity; Inefficient use of irrigation water
- 4. Plant Productivity; weeds

Lower East Gallatin

- 3. Human; urban sprawl; education for small landowners
- 4. Water Quality; sediment, temperature, nutrients

Gallatin River/Gallatin Gateway

- 3. Urban Sprawl; land use change, small acre education
- 4. Water Quantity; inefficient use of irrigation water/flooding/spring runoff

Madison River/Three Forks/Willow Creek

- 3. Water Quantity
- 4. Streambank Erosion

Missouri River Headwaters

- 3. Water Quantity; flooding
- 4. Urban Sprawl

Flathead Creek

- 3. Forest Health
- 4. Plant health and productivity; weeds

Sixteen mile creek

2. Weeds

Dry Creek

- 3. Soil erosion; streambank, wind
- 4. Animal; inadequate feed and forage

Smith Creek

- 3. Water Quantity; inefficient use of irrigation water
- 4. Urban Sprawl; small acre education

Bridger Creek/Upper East Gallatin River

- 3. Urban sprawl
- 4. Soil erosion; streambank

Hyalite Creek

3. Urban Sprawl; land use change

Water Quantity; urban use of water rights/inefficient use of irrigation water

Appendix C: Table of Impaired Streams in Gallatin County (MT DEQ)

Stream	Nutrient Concerns	Sediment Concerns	E. coli Concerns
Bear Creek	X	X	
Bozeman Creek	Х	Х	Х
Bridger Creek	Х		
Camp Creek	Х	Х	Х
Dry Creek	Х	Х	
East Gallatin River	Х		
Godfrey Creek	Х	Х	Х
Hyaite Creek	Х		
Jackson Creek	Х		
Mandeville Creek	Х		
Reese Creek	Х	Х	Х
Rocky Creek		Х	
Smith Creek	Х	Х	Х
Stone Creek		Х	
Thompson Creek	Х	Х	

Page 1 of 7

Natural Heritage Program

A program of the Montana State Library's Natural Resource information System operated by the University of Montana.

40 Species of Concern - Species Occurrences are not maintained for Animal PSOC, therefore we cannot filter these species geographically Filtered by the following criteria: County = Gallatin (based on mapped Species Occurrences) **Plant Species of Concern** Montana Natural Heritage - SOC Report

■ Introduction

B Species of Concern

Species of Concern 40 Species

ered by the following criteria: nty = Gallatin (based on mapped Species Occurrences)

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http://mtnhp.org/SpeciesOfConcern/?AorP=p

TAXA SORT

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documented. One site is relatively inaccessible and not likely to be threatened by human impacts. G4 S3 Species Occurrences verified in these Counties: Deer Lodge, Gallatin, Granite, Ravalli State Bank Reason: Rare to Uncommon. This entity is netricited to high elevation sites in the Bitterroot Banne and in the	Forests (B), (C) Sensitive, Suspected on Forests (BRT) Counties: Beaverhead, Gallatin here it is only known from a couple of st bare it is only known from a couple of st crestible and not tillely to be threatened counties: Deer Lodge, Gallatin, Granit Counties: Deer Lodge, Gallatin, Granit Counties: Deer Lodge, Gallatin, Granit	Sensitive - Known on Forests (BD, CG) Forests (BD, CG) Sensitive - Supected on Forests (BRT) Counties: Deaverhead, Gallatin femer it is only brown from a couple of si femer it is only brown from a couple of si femer it is only brown from a couple of si femer it is only brown from a couple of si femer it is only brown from a couple of si femer it is only in the single couple of si femer it is not single in the single in	Countles: Beaverhead, Flathead, Gallati distributed in the western half of the st ences. Occupied habitats are at moderal property of the standard of the st sensitive weeds and off-road ATV use is Sensitive. Known on Forests (BD, CG) Sensitive - Suspected on Forests (BRT) Countles: Beaverhead, Gallatin here it is only thrown from a couple of s cessible and not tilledy to be threatened to countles: Deer Lodge, Gallatin, Granti	Counties: Beaverhead, Flathread, Gallal distributed in the western half of the si rences. Occupied habitats are at modern 1, invasive weeds and off-road ATV use 1, invasive weeds and open stopeched on forests (BRT) Sensitive Suspeched on forests (BRT) Counties: Beaverhead, Gallatin famer It is only brown from a couple of stope the stope of t	Counter: Beaverhead, Gallatin, Sherid I restricted to very localized sandhilis ha unage sized populations, it responds possible to the proposed populations, it responds possible to the same size of populations, it responds to the same size of t	counties: Beaverhead, Cascade, Ferqui noal cendresi (beaverhead, Cascade, Ferqui noal cendresi (beaverhead, Callatin, Sherid is restricted to very localized sandhilis ha is varied posalation. It responds to have likely had an adverse effect on the seried posalation. It responds to have likely had an adverse effect on Counties: Beaverhead, Falthead, Gallatin distributed in the western hathead of the significant of the significant of the significant of the significant of the series. Occupied habitata are at moferties of the western stand off-road ATV use is Sensitive. Known on Forests (BD, CG) Sensitive. Sensitive Novemon from a couple of significant of the significant o	Counties: Beaverhead, Gallatin, Sherid to large stated probables are a modern from a feet between converted to agriculture and reasons on all endeam, control by invasive week counties: Beaverhead, Gallatin, Sherid to large stated populations, it responds to restricted to very localized sandhill: his or a state of the state of th	Counties: Broadwater, Deer Lodge, Fet bruish is known from a half dozen count bittar have been converted by invasive we was negatively impacted by invasive we was negatively impacted by invasive we was negatively impacted by invasive we restricted on very localized sandhills had to age stized Dopulativen; it responds to restricted to very localized sandhills had no adverse effect on the stized Dopulativen; it responds to the street of the sandhills had no adverse effect on the server head, Flatthead, Gallatin, Services, Occupied had an adverse effect on the western had off-road ATV use in the server weets and off-road ATV use Services (Cocupied had was peculiated on forests (BRT) Services of Suspected on forest	Counties: Beaverhead, Gallatin, Media: Idis is a regional effective from a half dozen count counties: Broadwater: Deer Lodge, Fer Counties: Broadwater: Deer Lodge, Fer Counties: Broadwater: Deer Lodge, Fer bitlat. Inwe Deer, Corerer did to agricultur tray negatively impacted by invasive we redirected to very localized sandhilis he is restificted to very localized sandhilis he is restificted populations, it responds pr try have likely had an adverse effect on try have weeds and frada A Tyu East Sensitive - Known on Counties: Beaverhead, Gallatin heart it is only prown from a couple of s tressible and not tillely to be threatened Counties: Deer lodge, Callatin, factority is restricted to had elevet Counties: Deer lodge callatin, factority is restricted to had elevet Counties: Deer lodge callatin, factority is restricted to had elevet Counties: Deer lodge callatin, factority is restricted to had elevet
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	st corner of the state, Pop	3 st corner of the state. Pop	e, Jefferson, Lewis and Cl tate to large populations, si which help to minimize of stions. 3	e, Jefferson, Lewis and Cl te to large populations, si vehich help to minimize e stions.	2 uptwestern and northeaste ance that maintains its spa species. 2 2 e, Jefferson, Lewis and Cit tate to large populations, si which help to minimize of tions. 3	populations, with most be populations, with most be populations, with most be a since that maintains its spacetes. 2 species. 2 c, Jefferson, Lewis and Cl te to large populations, si to which help to minimize the to large populations, si to which help to minimize to the state. 3	orizan articles, park orizang laplotty oused for livestock grazing populations, with most be populations, with most be populations, with most be populations, with most be concern and northeaste allowestern and northeaste allowestern and content of the specific state to large populations, sit which help to minimize distons.	2 rona, Madison, Park used for Ilvestock grazing , Meagher, Park, Sweet G populations, with most be populations, with most b populations, with most b populations, with most b commercial populations, with most b populations, with most b commercial populations, with most b populations, Lewis and Cl commercial populations, si population	east-central Idaho and no be vulnerable to intensive according with the majority used for livestock grazing, wheather, Park, Sweet G populations, with most be populations, with most be populations, with most be populations, and contract the maintains its spaceties. 2 2 2 2 2 2 2 2 2 4 4 4 4 4 6 2 6 2 6
	Population levels are poorty	Rock/Talus Rock/Talus	d Clark, Park, Pondera, Powell, rs, sks small occurrences and nine to disturbance to some of the Rock/Talus. Population levels are poorly	Alpine d Clark, Park. Pondera, Powell, rs, six small occurrences and nine its disturbance in some of the Rock/Talus. Population levels are poorly	Sandy sites seastern corners of Montana where it is spaniely vegetated habitat. Fire spaniely vegetated habitat. Fire d Clark, Park, Pondera, Powell, s, sk small occurrences and nine to disturbance to some of the Rock/Taits. Population levels are poorly	Wetland/Riparian et Grass st being relatively small. Ho breat st being relatively small. Ho breat Sandy sites Sandy sites Sandy sites Alpine d Clark, Park, Pondera, Powell, rs, sk small occurrences and nine ter disturbance to some of the Rock/Talus. Population levels are poorly	Ity of documented locations on are; Additionally, populations are tigns: Wetland/Riparian et Grass Sandy sites Sandy sites Sandy sites Sandy sites Sandy sites Aprine Alpine d Clark, Park, Pondera, Powell, r., six small occurrences and nine to disurbance to some of the Rock/Talts. Population levels are poorly	Wetland/Riparian thy of documented locations on the Additionally, populations are Wetland/Riparian et Grass st being relatively small. Ho threat st being relatively population bevelous and nine d Clark, Park. Pondera, Powell, r., sk small occurrences and nine to disturbance to some of the Rock/Talls. Population levels are poorty	I northwest Wyoming, in Montana i naive grazing and competition from Wetland/Riparian ity of documented locations on ing, Additionally, populations are of Grass Wetland/Riparian to the grazing relatively small, No threat the ing relatively small, No threat is spansely vegetated habitat. Fire Alpine d Clark, Park, Pondera, Powell, s, sk small occurrences and nine to disturbance to some of the Rock/Taits.
Species Occurrences verified in these Countles: Beaverhead, Gallatin State Rank Reason: Rare in Nontana where it is only known from a couple of sites in the southwest corner of the state, Population levels are poorly	erbush var, macronema Aster Juntowers	coldea Haplopappus macronema Aster/Sunflowers G4G5T4 52 Sensitive - Known on Aster/Sunflowers Sensitive - Known on Sensitive - Known on Aster/Sunflowers Sensitive - Supported on Forests (BR.T.)	Mustards Species Occurrences verified in these Counties: Beaverhead, Flathead, Callatin, Clacler, Granite, Jefferson, Lewis and Callatin, Clacker, Granite, Jefferson, Lewis and Callati	la Brasicaceae GS S2 Austards Austards Ravalli, Silver Bow, Sweet Crass Ravalli, Silver Bow, Sweet Crass State Ravi Resson: Doub developed in these Countries: Beaverhead, Gallatin, Glacier, Granite, Jefferson, Levis and Countries State Ravi Resson: Doub developed in the western half of the state in four modernate to large populations, blackerial or postly documented occurrences. Occupied habitats are at modernate on high elevation which help to minimize populations. Hence of the state in four modernate to high elevation which help to minimize weeks and off-read ATV use impact some populations. Sensitive - Known on Asterraceae Var. macronema Asterraceae G4GST4 S2 Suspected on Torests Suspected on Torests Suspected on Torests (BRT) Suspected on Torests	Poraginaceae Boraginaceae State Anank Rasson: Fendler cat's-eye is restricted to very localized sandhilic habitat in the far southwestern and northeast known from a total of three moderate to large-cited populations. It responds positively to disturbance that maintains its quapression and dune stabilization efforts have likely had an adverse effect on populations of this species. 2 brassicaceae Brassicaceae Brassicaceae Species Occurrences verified in these Counties: Beaverhead, Gallatin, Glacler, Granite, Jefferson, Levis and Callatin, Glacler, Granite, Jefferson, Levis	Castileja miniata ssp. Orobanchaceae Bromrape Family Broasicaceae Borage Family Brassicaceae Mustards Mustards Var. macronema Aster/Sunflowers	Castllejs miniata ssp. Castllejs miniata ssp. Crobanchaceae Broomrape Family Brassicaceae Borage Family Brassicaceae Mustards Aster/Sunflowers	Castileja minor ssp. minor Orobanchaceae Broomrape Family Gantileja miniata ssp. Grobanchaceae Broomrape Family Broasicaceae Borage Family Brassicaceae Buratards Mustards Asteraceae Asteraceae	Castlleja minor ssp. minor Orobanchaceae sh minista ssp. Orobanchaceae sh minista Dorobanchaceae Broomrape Family Broomrape Family Broasicaceae Borage Family Brassicaceae Mustards Maplopappus macronema Aster/Sunflowers
Broomrape Family Bornginaceae Bornge Family Brassicaceae Mustards Hapilopappus macronema Asteraceae	Brossicaceae Mustards Brossicaceae	Broomrape Family Bornginaceae Bornge Family Brassicaceae	Bromrape Family Borage Family	ush miniata Broomrape Family			эгоэни врс ганну	Castilleja minor ssp. minor Orobanchaceae inthrush Broonrape Family	Castilleja minor ssp. minor Orobanchaceae inthrush Groomrabe Family

Mimulus primuloides Primrose Monkeyflower		Myrlophyllum quitense	Andean Water-milfoli	Oxytropis deflexa var.	Nodding Locoweed	Pedicularis pulchella	Mountain Lousewort	Penstemon humilis	Low Beardtongue	Penstemon whippleanus Whipple's Beardtongue		Physaria saximontana var. dentata	Rocky Mountain Twinpod	Primula incana Mealy Primose			Senecio hydrophilus	Alkali-marsh Ragwort
Phrymaceae Lopseed Family		Haloragaceae	Water wilfoils	Fabaceae	Pea Family	Orobanchaceae	Broomrape Family	Plantaginaceae	Plantain Family	Plantaginaceae Plantain Family		Brassicaceae Mustards		Primulaceae Primuse family			Asteraceae	Aster/Sunflowers
G4	Species Occurrer State Rank Reaso moderate to large also vulnerable to	GAR	Species Occurrer State Rank Reaso In slow-moving ri- locations represen flowering or fruits assess the true at	6575	Species Occurrer State Rank Reaso state.	ವ	Species Occurrences ve State Rank Reason: Rest few collections indicate.	65	Species Occurrer State Rank Reaso	65	Species Occurrer State Rank Reaso recent. The speci	CILCO	Species Occurren Park, Pondera, Po State Rank Reaso	G.	Species Occurren Silver Bow, Teton	State Rank Reaso most known popul and private lands, occurrences. Catt vulnerable to acti habitat quality m	65	Species Occurren
ES	ces verified in these Co n: Known from several w sized populations. Two i changes in hydrology and	\$3	ces verified in these Con. Myriophyllum gultens on: Myriophyllum gultens ers that vary in water gu it a very narrow geograph ing structures, use of an a undance and distribution	5253	n: Rare in Montana, when	S3	ces vertfled in these Con: Restricted to high elendicate.	\$153	ces verified in these Coin: Known in Montana from	23	ces verified in these Co n: Whippie's beardtongue es occupies high elevation	ន	Species Occurrences verified in these Counties: Beav Park, Pondera, Powell, Silver Bow, Sweet Grass, Teton State Rank Reason: State endernic known from several	8	ces verified in these Co	State Rank Reason: Primula Incora is known from a few dozen o most known populations are small, and the status of several populations are small, and the status of several populations are small, and the status of several populations and private lands', including several locations managed or protect and pratect lands, and protections are several populations. Cattle grazing may have some negative effects on to occurrences. Cattle grazing may have some negative effects on to vuinternable to activities that after the hydrology of the wetlands vuinternable to activities that after the hydrology of the wetlands habitat quality make the soccess vulnerable to locate setting the habitat quality make the soccess vulnerable to locate habitat quality make the soccess vulnerable to locate habitat quality make the soccess vulnerable to activities of habitat quality make the soccess vulnerable to locate habitat quality make the soccess vulnerable to habitat quality make the socces	S3	Species Occurrences verified in these Counties: Bes State Rank Reason: Senecio hydrophilus is present in
Sensitive - Known on Forests (BD, BRT)	Species Occurrences verified in these Counties: Beavenhead, Deer Lodge, Callatin, Ravalli Species Occurrences verified in these Counties: Beavenhead, Deer Lodge, Callatin, Ravalli State Bank Reason: Known from several watersheds in southwest Montana, occurring almosts entirely on historical the stations are also known. For many adversely impact M. primuloides though more study is needed. It is also vulnerable to changes in hydrology and one population could be adversely affected by activity at an adjacent ski area.		Species Occurrences verified in these Counties: Brosilvater, Callatin, Madison State Bank Reason: Aprilophyllum quiteris it an equatic plant that has recently (2004-2016) been found in three waterbookes of Montana, Plants are found in slow-moving fiver; but voy in variet quality from the Madison flower in Yellowsche National Park to Tosson Reservoir on the Missouri River. These in slow-moving fiver; but voy in variet quality from the Madison flower in Yellowsche National Park to Tosson Reservoir on the Missouri River. These incircious represent a very narrow geographical portion of Montana. Proper Identification of Myrlophyllum species require careful collections to obtain flowering or foulting structures, use of an appropriate and current caronomic key, and time spent studying the spectmen. More surveys are greatly needed to special to the shundance and distribution of Myrlophyllum quiteres in Montana.		Species Occurrences verified in these Counties: Beaverhead, Gallatin, Nadison, Park State Bank Reason: Rare in Montana, where it has been documented from a few, high-elevation sites in the mountains of the southwest portion of the state.		Species Occurrences werified in these Counties: Carbon, Deer Lodge, Galtatin, Granite, Madison, Park, Powell State Bank Reason: Restricted to high elevation areas of southern Montana. Limited data are available for the species and few collections indicated:		Species Occurrences verified in these Counties: Deaverhead, Gallatin, Lewis and Clark, Lincoln, Madison, Meagher, Missoula, Park, Powell, Ravalli State Rank Reason: Known in Montana from 1 collection from Beaverhead County		Species Occurrences verified in these Counties: Besverinead, Gallatin, Abdison State Tank Reason: Whippes beautilengue occurs at the object of its range in Montan, and its known here from just two collections, only one of which is Terent. The species occurate high elevation, rocky habitat that is relatively untreastened.		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Cerbon, Chouteau, Fergus, Flathead, Gallatin, Glacier, Lewis and Clark, Madison Park, Pondera, Powell, Silver Bow, Sweet Grass, Teton State Bank Reason: State endemic known from several counties across central and southern Montana mountain ranges.	Sensitive - Known on Forests (BD) Sensitive - Historically known, not recently documented on Forests (CG)	Species Occurrences verified in these Counties: Beaverhead, Broadwater, Carbon, Deer Lodge, Gallatin, Jefferson, Madison, Meagher, Powell, Sheridan, Silver Bow, Teton	State Bank Reason: Primula Incore is known from a few dozen extant occurrences in Montana, including several moderate to large populations. However, most known populations are small, and the status of several populations is uncertain. Ownership of the occupied areas is varied and includes federal, state and private lands, including several locations managed or protected for their conservation values. However, unprotected private lands including several locations managed or protected for their conservation values. However, unprotected private lands have stated by the species for their conservation values. However, unprotected private lands have stated to activities that alter the hydrology of the wettands it occupies; Continued threats and potentially declining trends; particularly in regards to habitat qualify make the species (hydrology of the wettands it occupies; Continued threats and potentially declining trends; particularly in regards to habitat qualify make the species (without softmation).		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Flathead, Gallatin, Madison, Missoula, Park, Powell State Rank Reason: Senecio hydrophilus is present in alkaline habitats within a portion of southwest Montana. Plants are not that common, and occur in low-
3	II st entirely on National Forest lands ersely impact M. primuloides thou activity at an adjacent ski area.		 been found in three waterbodle onal Park to Toston Reservoir on the Myrlophyllum species require can spent studying the specimen. Mor spent studying the specimen. 	3	ation sites in the mountains of the				incoln, Madison, Meagher, Missoula		is known here from just two colle		eau, Fergus, Flathead. Gallatin, Gi n Montana mountain ranges.	2	odge, Gallatín, Jefferson, Madison	ana, including several moderate to inship of the occupied areas is vari- values. However, unprotected priv- riect effects of herbivory and train- test and potentially declining tren-		outhwest Montana. Plants are not
Fens and wet meadows	ds. Eight of the occurrences are ugh more study is needed. It is.		es of Montans. Plants are found the Missouri River. These breful collections to obtain ore surveys are greatly needed to	Alpine	southwest portion of the	Alpine	t may be more conviton than the	Sagebrush steppe (Montane)	a, Park, Powell, Ravalli	Open areas (subalpine and alpine)	ctions, only one of which is	Gravelly slopes/talus (Montane/subalpine)	lacier, Lewis and Clark, Madison	Wetland/Riparian	n, Meagher, Powell, Sheridan,	o large populations. However, led and includes federal, state rate lands host many pling. The species is also ds, particularly in regards to		ell that common, and occur in low

Oregon Checker-mallow	oregon checher-mattoy	1	Northwestern Thelypody	Thelypodium sagittatum Slender Thelypody		Viguiera multiflora Hellomeris multiflora	Many-Howered Viguiera
		Thelypodium sagittatum	arpum			multiflora	
Malvaceae Mallow Family	wallow Farmly	Brassicaceae	Mustards	Brassicaceae Mustards		Asteraceae	Aster/Sunflowers
GS	Species Occurrent State Rank Reason and both locations weedy species. The construction.	G2.	Species Occurrent State Rank Reason	G ₄	Species Occurrent State Rank Reason	G4G5	Species Occurrent State Rank Reason Counties
\$253	es verified in these it known from two wi have a large compon is Lake County popula	HS	: Known only from an	52	es verified in these is Known from numero	\$253	es verified in these to Knewn from one ex
	Species Occurrences verified in these Counties: Gallatin, Lake State Bank Reason: Known from two widely separate sites in Ga State Bank Reason: Known from two widely separate sites in and both locations have a large component of weedy species, Ho weedy species. The Lake County population occurs near and alor construction.		Species Occurrences verified in these Countles: Beaverhead, Gallatin, Madison State Rank Reason: Known only from an 1899 collection in Beaverhead County, a		Species Occurrences verified in these Counties: Beaverhead, Gallatin State Rank Reason: Known from numerous occurrences in extreme sour		Counties: Beaverhead, Clant occurrence in Beave
	llatin and Lake counties. wever, 5. oregond appea ig Highway 93 and has th		Species Octurrences verified in these Counties: Baiwchead, Galiatin, Madison State Rank Reason: Known only from an 1899 collection in Beaverhead County, although Dorn (1984) also reports it for Madison County,		Species Occurrences verified in these Counties: Beaverhead, Gallatin State Rank Reason: Known from numerous occurrences in extreme southwestern Montana		Species Occurrences verified in these Counties: Beaverhead, Carbon, Cascade, Gallatin, Aadison State Bank Reason: Known from one extant occurrence in Beaverhead County and four historical collections from Beaverhead, Gallatin and Aadison Country.
	Habitats occupied by the research of tolerating e potential to be significential to be significent of the significant of the si		Dom (1984) also reports				, Madison Istorical collections from
1	e species are at least some antly negative		it for Madiso	3		3	Beaverhead
Grasslands (low-elevation)	Species Occurrences verified in these Counties: Gallatin, Lake State Bank Reason: Known from two videly separate sites in Gallatin and Lake counties; Habitats occupied by the species are susceptible to weed invasion State Bank Reason: Known from two videly separate sites in Gallatin and Lake Counties of the species are susceptible to weed invasion and both locations have a large component of weedy species; However; S. oregona appears capable of tolerating at least some competition from these weedy species. The Lake County population occurs near and along Highway 93 and has the potential to be significantly negatively impacted by highway construction.	Wetland/Riparian	yn County.	Alkaline meadows (Valleys and Montane)		Aspen woodlands	, Gallatin and Madison

Small-winder Sector	Carex stenoptila		Glaucus Beaked Sedge	alfine more	Carex occidentalis	Mary-ribbed sedge	Carex multicostata		Carex idahoa Carex Idaho Sedge	PART CHIOL	Allium similimum		FLOWERING PLANTS - MONOCOTS (LILIOPSIDA)
									Carex parryana ssp. idahoa Cyperaceae Sedges			OTHER NAMES	ONOCOTS (LILIOP
Sedges	Cyperaceae		Cyperaceae Sedges	Seages	Cyperaceae	Sedges	Cyperaceae		Cyperaceae Sedges	8	Liliaceae	FAMILY (SCIENTIFIC) FAMILY (COMMON)	SIDA)
Species Occurrence	63	Species Occurrent State Rank Reason the name Carex ro	65	Species Occurrent State Rank Reasor County.	64	Species Occurrent State Rank Reason available for the sp	65	Species Occurrent State Rank Reason public lands. The e palatable, and pop development and r	8	Species Occurrent State Rank Reason survey data are lin	G4	GLOBAL	
ces verified in thes	S2S3	Species Occurrences verified in these Coun State Rank Reason: This is a rare species in a the name Carex rostrata in many past Floras	5253	ces verified in the	SH.	ces verified in then I: A rare species in pecies in Montana.	5253	ces verified in the 1: idaho sedge is a i estimated number o sulations may be afro to an struction in	53	Species Occurrences verified in these Counties: State Rank Reason: Rare in Montana, where it is k survey data are limited for the species in Montana.	527	STATE RANK	
e Countles: Carb		e Counties: Flati cies in Montana, I Floras.		a from an 1887 co		e Counties: Beav Montana, scatter However, the pot		regional endemic regional endemic of stems is in the fected by heavy a naintenance. Upd		where it is know s in Montana.		usews	
Species Occurrences verified in these Counties: Carbon, Gallatin, Madison, Mineral, Park, Ravalli, Sheridan, Stillwater, Sweet Grass, Toton		Species Cocurrences wrifted in these Counties: Flathead, Gallatin, Lincoln, Missoula, Stillmater. State Rank Reason: This is a rare species in Montana, not to be confused with the more common Corex utriculato, which had the name Corex rostroto in many past Floras.	Sensitive - Known on Forests (KOOT, LOLO)	Species Occurrences writted in these Counties: Beaventeed, Calabin, Silver Bow State Rank Reason: Known in Montana from an 1897 collection by Tweedy near "Bodder Creek" and a 1930 collection on William Creek in Beaventeed County.		Species Courrences werlfied in these Counties: Beaverhead, Carbon, Gallatin, Grantier, Missoula, Park, Ravaill State Rank Reason: A rare species in Montana, scattered in the mountains of the southwest and south-central portions of the available for the species in Montana. However, the potential for negative impacts to the populations appears to be low.		Species Occurrences verified in these Counties: Beaverhead, Broadwater, Deer Lodge, Gallatin, Madison, Powell, Silver Isow State Bank Reason: Idaho sedge is a regional endenic known from several dozen siter in Kontana which custer into approx 15-20 populations, mo public into the restimated number of stems is in the tens of thousands, but total occupied habitat has been estimated at less than 200 acres. The publications, and populations may be affected by heavy grazing. Other risks are competition from exoits pepties, hydrologic alterations, agricultural development and road construction/maintenance. Updated population data and related size information are needed.	Sensitive - Known on Forests (BD)	Species Occurrences welfied in these Counties: Gallatin, Lincoln, Ravalli State Bank Reason: Rare in Montana, where it is known from only a few locations in the southwest portion of the state near survey data are limited for the species in Montana.		USFS	
eral, Park, Ravalli, St		ssoula, Stillwater e more common Core		Boulder Creek" and a		Granite, Missoula, Pa southwest and south s to the popoulations		r Lodge, Gallatin, Mac sites in Montana whi al occupied habitat ha npetition from exotic related site informati	SENSITIVE	s in the southwest po		BLM	COUNTY - GA
reridan, Stillwater, Swe		x utriculata, which had	3	1930 collection on Will		rk, Ravalli -central portions of the appears to be low.		dison, Powell, Silver Bo ch cluster into approx is been estimated at le species, hydrologic alt on are needed.	2	rtion of the state near		ANPS THREAT CATEGORY	COUNTY - GALLATIN basted of p
Species Occurrences verified in these Counties: Carbon, Gallatin, Madison, Mineral, Park, Ravalli, Sheridan, Stillwater, Sweet Grass, Teton	Grasslands (Montane)	nd been mistakenly treated under	Fens	llow Creek in Beaverhead	Dry, montane to alpine	ne state. Very little data are	Grasslands (Montane)	Species Occurrences verified in these Counties: Beaverhead, Broadwater, Deer Lodge, Gallatin, Madison, Powell, Silver Bow State Bank Reason: Idaho sedge is a regional endemic known from several dozen sites in Menthaw which cluster into approx 15-20 populations, most on State Bank Reason: Idaho sedge is a regional endemic known from several dozen sites in Menthawa which cluster into approx 15-20 populations, most on public knots. The estimated number of stems is in the tens of thousands, but total occupied habitat has been estimated at less than 200 acres. The species is publicable, and populations may be affected by heavy grazing. Other risks are competition from exolic species, hydrologic alterations, agricultural development and road construction/maintenance. Updated population data and related site information are needed.	Wetland/Riparian	r the idaho border, Available	Mesic Grasslands-Meadows	навтат	14 SPECIES

Beaked Spikerush		Eriophorum gracile Siender Cottongrass		Muhlenbergia andina	Foxtail Muhly		Muhlenbergia	Annual Muhly	Spiranthes diluvialis	Cocca n. cannel and	Sporobolus neglectus Small Drooseed		Stipa lettermanii A		Veratrum californicum California False-hellebore	
									Ute Lady's-tresses				Achnatherum lettermanii			
Sedges		Cyperaceae Sedges		Poaceae	Grasses	or support	Poaceae	Grasses	Orchidaceae	Orchias	Poaceae	Cience	Poaceae Grasses		Lillaceae	
5	Species Occurrence Teton State Rank Reason Viability of the species	GS.	Species Occurrence State Rank Reason Populations occur of activities that may	64	Species Occurrence	Species Occurrence State Rank Reason drained soils. It can habitat and/or spec population sizes, ha	65	Species Occurrence State Rank Reason occur in northeast / decades, but not re bring forth current	G2G3	Species Occurrence State Rank Reason: Missouri, Jefferson, have less than 100 i have been converte populations occur o	G5	State Rank Reason:	65	Species Occurrence State Rank Reason: information needed	8	Species Occurrence State Rank Reason:
×	es verified in these Countis : Known from over a dozen o :ies in the state. The specie	83	Species Occurrences verified in these Counties: Flathe State Rauk Reason: Known from a very few large popular Opulations occur on a mix of federal, state and private activities that may after the hydrology of occupied sites.	5253	es verified in these Countie	es verified in these Countie Muhlenbergia andino occur Muhlenbergia ondino occur be found along streams, in be found along streams, in ific micro-habitat character bitat, and threats is greatly	53	es verified in these Countie Muhierbergia minutissimo Montana, but specimens hav located (Matt Lavin persona data on locations, populatio	S152 LT	es verified in these Countie Spiranthes dituvialis (Ute to Spiranthes di Audio Beaverhead, Ruby and Madio Beaverhead, Ruby and Couple ordividuals, though a couple to agricultural uses. Livest n private lands and only one	\$152	Rare in Montana, where it i	5153	Species Occurrences verified in these Counties: Beaverhead, B State Rank Reason: Documented from several locations in the so information needed to determine the species status are lacking.	\$2	Pare in Montana, where it i
Sensitive - Known on Forests (Bb, CG, HLC) Species of Conservation Concern on Forests (FLT)	Species Occurrences verified in these Counties: Carbon, Flathead, Gallatin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Park, Sanders, Sweet Grass, Techn Techn State Rank Reason: Known from over a dozen extant sites and a few historical locations. Private and state lands host many occurrences that are vital to the viability of the species in the state. The species is vulnerable to hydrologic alteration and development.	Sensitive - Known on Forests (CG, KOOT) Species of Conservation Concern on Forests (FLAT)	Species Occurrences verified in these Counties: Plathead, Gallatin, Lake, Lincoin, Madison, Missiala, Park, Powell State Plank Reason: Known from a very few large populations, several smaller populations and a half dozen historical or poorly documented locations. Populations occur on a mix of federal, state and private ewnerships in northwest Hontana at low to moderate elevations. Populations are vulnerable to any activities that may after the hydrology of occupied sites.		Species Occurrences verified in these Counties: Broadwater, Carbon, Cascade, Galiatin, Granite, Lake, Lewis and Clark, Madison, Park State Rank Reason: Milylindherold profilm occurs whelev contended in warrant and counting the contended in the	Species Occurrences verified in these Counties: Broadwater, Carbon, Cascade, Callatin, Granite, Lake, Levis and Clark, Madison, Park. State Rank Reason: Muhlersbergid ordino occus widely scattered in western and south certical Montana. It grows in damp places, but often with well- drained sells. It can be found along streams, in wet meadows and seeps, and around hot springs. The low number of collections in combination with limited habitant and/or specific micro-habitant characteristics indicates it is either rare, declining, or over-looked in flatistic surveys. Current data on locations, population sizes, habitat, and threats is greatly needed to better assess its status in Montana.		Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison, Missoula, Ravalli, Silver Bow State Rank Reason: Muhierbergie minutasima is forom locations observed from 1895 to 2015 in central and western Montana, it is also reported to Social in northeast Montana, but speciment have not been located (Peterson in PMA 2021). A 1941 occurrence rear Belgrade has been searched for in recent decades, but not re-located (Matt Marin personal communication). Plants can occuracy disturbed areas, yet populations may not be persisting. Surveys that bring forth current data on locations, populations sizes, habitat requirements, or threats is needed.		Species Occurrences verified in these counties: Beaverhead, Broadwater, Gallatin, Jefferson, Madison State Rank Reason: Spiranthes disvolid (Ute balles: Iresses) is known from only a handick of occurrences in southwest and south-central Montana in the Missoun; Jefferson, Beaverhead, Ruby and Madison River drainages, is, disvolid is restricted in area by specific hydrologic requirements. Many populations have been then 100 individuals, though a couple have over 500 plants. Sites are asceptible to hydrologic banges and weed invasion, Large areas of habitat; have been converted to applicational uses; Livestock grazing is also as common use of these habitats. Two populations occur along highway right of ways, Muse. Most populations occur on private lands and only one occurrence is currently provided some potential protection or management for its conservation value. Most of these habitats is a supplementation of the second provided some potential protection or management for its conservation value. Most of these habitats are supplementations of the second provided some potential protection or management for its conservation value. Most of the second provided some potential protection or management for its conservation value. Most of the second provided some potential protection or management for its conservation value. Most of the second provided some potential protection or management for its conservation value. Most of the second provided some potential protection or management for its conservation value. Most of the second provided some provided some potential protection or management for its conservation value.		Species Occurrences verified in these Counties: Gallatin, Sanders, Wheatland State Rank Reason: Rare in Nontana, where it is known from a few widely scattered and poorly documented sites		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Carbon, Gallatin, Madison, Mineral, Park, Powell State Rank Reason: Countmented from several locations in the southern portion of the state. However, population levels, site information needed to determine the species status are lacking.	Sensitive - Known on Forests (BD, BRT) Sensitive - Suspected on Forests (CG, HLC)	Species Occurrences verified in these Counties: Gallatin, Granite, Lewis and Clark, Lincoln, Meagher, Powell, Ravalli State Rank Reason: Pare in Montana, where it is known from a very localized area in the southwestern corner of the state.
Li.	d Clark, Lincoln, Madison, Meas ale and state lands host many reforment	2	Missoula, Park, Powell d a half dozen historical or poo low to moderate elevations. Po		unite, Lake, Lewis and Clark, M	unite, Lake, Lewis and Clark, M al Montana. It grows in damp p gs. The low number of collecti ver-looked in floristic surveys.		availl, Silver Bow to 2015 in central and western 941 occurrence near Belgrade d areas, yet populations may n reded.	2	n, Madisan occurrences in southwest and i n area by specific hydrologic ro hydrologic changes and weed ii flats. Two populations occur al fall protection or management		ty documented sites.		dison, Mineral, Park, Powell lowever, population levels, siti		Meagher, Powell, Ravalli hwestern comer of the state.
Wetlands (Alkaline)	gher, Park, Sanders, Sweet Gras occurrences that are vital to th	Fens	orly documented locations.		adison, Park	ladison, Park laces, but often with well- ons in combination with limited Current data on locations,		Anntana. It is also reported to has been searched for in recent of the persisting. Surveys that	Wetland/Riparian	south-central Montana in the equirements. Many populations massion, Large areas of habitat long highway right-of-ways. Mon for its conservation value.	Grasslands (low-elevation)		Talus and Grasslands (low- elevation)	characteri	Wetland/Riparian	

vens		The second secon						rimpricitid revolvens	Principalitation with
GLOBAL STATE USFYS USFS BLIM CATEGORY CATEGORY					51	G5	Amblystegiaceae	Drepanocladus revolvens,	corpidium revolvens
	MNPS THREAT CATEGORY	ВСМ	usrs	usrws	STATE RANK	GLOBAL	FAMILY (SCIENTIFIC) FAMILY (COMMON)	OTHER NAMES	COMMON NAME TAXA SORT

■ Potential Species of Concern

Potential Species of Concern 6 Species
Filtered by the following criteria:
County = Callatin (based on mapped Species Occurrences)

yperboreus		SUNSOFT MOTINEYTOWER	Mimulus suksdorfii	Con Michael Despitation	Balsamorhiza macrophylla	Carnea	ckschewitzii	COMMON NAME TAXA SORT	FLOWERING PLANTS - DICOTS (MAGNOLIOPSIDA)
	Ranunculus natans					carnea	Agoseris aurantiaca var.	OTHER NAMES	HCOTS (MAGNOLI
Buttercup Family	Ranunculaceae	Lopseed Family	Phrymaceae		Aster/Sunflowers	ASSET/Sunflowers	Asteraceae	FAMILY (SCIENTIFIC) FAMILY (COMMON)	OPSIDA)
Species Occurrences verified in these Counties: Beaverhead, Carbon, Deer Lodge, Gallatin, Jefferson, Madison, Missoula, Silver Bow,	65	Species Occurrence	G4	Species Occurrences verified in State Bank Reason: This species known populations are moderate collection. Invasive weeds are no negatively impacting the species.	6365	Species Occurrences verified in the Park, Silver Bow, Sweet Grass State Rank Reason: See rank details.	GAQ	GLOBAL	
es verified in thes	5354	es verified in thes	\$354	ces verified in thes it: This species occu are moderate to it weeds are not a p weeds are not a p ng the species.	5354	ces verified in thes weet Grass n: See rank details.	5354	STATE RANK	
e Counties: Beav		e Counties: Beav		re Counties: Beavers in Montana at the American at the American at sites or robiem at sites or the American at sites or t		se Counties: Beav	20	USFWS	
Species Occurrences verified in these Counties: Beaverhead, Carbon, Deer Lodge, Gallatin, Jefferson, Madison, Missoula, Silver Bow, Valley		erhead, Carbon, Gallatir		Species Courrences verified in these Counties: Beaverhead, Gallatin, Madison State Rank Reason. This species occurs in Austrian as the edge of Its range when known populations are moderate to large in size and in generally good-quality in collection. Invasive weeds are not a problem at sites occupied by Bottsmorhiza negatively impacting the species.	Sensitive - Known on Forests (BD, CG)	erhead, Carbon, Cascad		SASN	
dge, Gallatin, Jefferson		, Lewis and Clark, Mad		n ire it is known from the abitat. One occurrence macrophylla and livest		e, Deer Lodge, Gallatin		BLM	COUNTY - GA
n, Madison, Missoula, Silv		Species Occurrences verified in these Counties: Beaverhead, Carbon, Gallatin, Lewis and Clark, Madison, Missoula, Park, Rosebud, Silver Bow		Species Cocurrences verified in these counties: leaverhead, Gallatin, Medison it State Rank Reason. This species occurs in doubtan as the edge of its range where it is known from three southwestern Motiona mountain ranges. Ma known populations are moderate to large in late and in generally good-quality habitat. One occurrence in Gallatin County is only wown from a 1931 collection, invasive weeds are not a problem at sites occupied by <i>Balsamoritza macrophylia</i> and tivestock grazing at some of the sites does not apport regalitively impacting the species.	3	, Granite, Judith Basin, I		MNPS THREAT CATEGORY	LLATIN based on mo
er Bow, Valley	Wetland/Riparian (Montane)	ebud, Silver Bow		Species Cocurrences verified in these counties: leaverhead, Gallatin, Modison State Rank Reason. This species occurs in doubtain as the edge of its range where it is known from three southwestern Montain mountain ranges. Most of the known populations are moderate to large in size and in generally good-quality habitat. One occurrence in Gallatin County is only violent from a 1931 collection, invasive weeds are not a problem at sizes occupied by <i>Balsamori hiza marcophyllia</i> and threstock grazing at some of the sizes does not appear to be regatively impacting the species.	Sagebrush-grassland	Species Occurrences verified in these Counties: Beaverhead, Carbon, Cascade, Deer Lodge, Gallatin, Granite, Judith Basin, Liberty, Madison, Meagher, Park, Silver Bow, Sweet Grass State Bank Reason: See ravid details.		навпат	GOUNTY - GALLATIN based on mapped Species Decurrences

SCIENTIFICINAME	GLOBAL	STATE	USFWS	USFS	BL.A.	ANPS THREAT CATEGORY	навпат
		CORN					

Slender Wedgegrass	Sphenopholis		parviflorum Small Yellow Ladys-slipper
major	Sphenopholis obtusata var. Poaceae		Abu hearing carceous
Grasses	Poaceae		Orchids
Species Occurre State Rank Reas assign a conserva	GS	Species Occurre Alissoula, Ponders State Rank Reas occurrences have federal, state an and timber harve and the number warrant a re-listi	S
Species Occurrences verified in these State Rank Reason: Rare in Montana, v assign a conservation rank are lacking.	5354	Species Occurrences verified in these Counties: Missoula, Pondera, Stillwater, Sweet Grass, Teton State Rank Reason: Many occurrences known from cocurrences have small population numbers, thou federal, state and private ownerships with varied and the number of populations scattered over a warrant a re-listing as a Species of Concern in Horo occurrences should be managed to maintain habit.	88
Counties: Big Horn, Bi where it has only been		Species Occurrences werfled in these Coanties: Big Horn, Carter, Flathread, Gallatin, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Linc Missoula, Pondera, Stillwater, Sweet Grass, Teton State Bank Reason: Hany occurrences known from the western half of the state, including a dozen or so historical or poorly documented sites. Many occurrences known from the western half of the state, including a dozen or so historical or poorly documented sites. Many occurrences have small populations unmbers, though approximately two dozen occurrences are moderate to large populations. Populations occur on refederal, state and private ownerships with varied land uses and management. A variety of fand uses and activities, including development, livestock and timber harvesting may have detrimental impact to populations. However, yellow lady-stilppen appears to be tolerant to some disturbances at land the number of populations scattered over a wirde area reduces the risk to the species. A loss of populations or a significant decline in numbers in warrant a re-listing as a Species of Concern in Montana, and populations should continue to be monitored on a semi-regular basis. Moderate to large occurrences should be managed to maintain habitat and viable population numbers.	Senst For K Senst
oadwater, Fergus, Fla focumented from a ve		arter, Flathead, Gallat m half of the state, inv ately two dozen occur d management. A vari d management was to the stores the store of the sp pulations should cont population numbers.	Sensitive - Known on Forests (CG, HLC, KOOT, LOLO) Sensitive - Suspected on Forests (BRT)
thead, Gallatin, Judit ry few collections, the		tin, Granite, Jefferson cluding a dozen or so i cluding a dozen or so i rences are moderate fety of land uses and a lety of land uses and a well adys-slipper appearencies. A loss of populatione to be monitored	
h Basin, Lake, Lewis a ough the population d		i, Judith Basin, Lake, instorical or poorly do to large populations. I tockwites, including do ars to be tolerant to sations or a significant on a semi-regular bas	2
Species Occurrences verified in these Counties: Big Horn, Broadwater; Fergus, Flathead, Gallatin, Judith Basin, Lake, Lewis and Clark, Phillips, Wheatland State Bank Reason. Rure in Montana, where it has only been documented from a very few collections, though the population data required to more precisely assign a conservation mark are lacking.	Mesic sites (low-elevation)	Species Occurrences verified in these Counties: Big Horn, Carter; Flathead, Gallatin, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Missoula, Pondera, Stillwater, Sweet Grass, Teton State Bank Reason: Hany occurrences known from the western half of the state, including a dozen or so historical or poorly documented sites. Many coccurrences have small population numbers, though approximately two dozen occurrences are moderate to large populations. Populations occur on variety of federal, state and private ownerships with varied land uses and management. A variety of favor due to the populations occurrence to populations, thousen the private ownerships with varied land uses and management. A variety of federal, state and private ownerships with varied land uses and management. A variety of fland uses and activities, including development, livestock grazing and the marber harvesting may have decrimental impacts to populations. However, yellow lady-stilpper appears to be tolerant to some disturbances at town levels and the number of populations scattered over a wirde area reduces the risk to the species. A loss of populations or a significant decline in numbers may warrant a re-listing as a Species of Concern in Montana, and populations should continue to be monitored on a semi-regular basis. Moderate to large occurrences should be managed to maintain habitat and viable populations marbers.	

^{⊞ 🖾} Special Status Species

[■] Additions To Statewide List

^{■ 🖾} Species Removed From Statewide List

Hoary Bat

Page 1 of 8

Montana Natural Heritage - SOC Report **Animal Species of Concern**

53 Species of Concern

1. Special Status Species
Filtered by the following criteria:
County = Gallatin (based on mapped Species Occurrences)

⊞ ☐ Introduction Expand All | Collapse All

B Species of Concern Species of Concern 53 Species

sos bison ared by the following criteria: nty = Gallatin (based on mapped Species Occurrences) Vespertitionid Bats Bovidae Bison / Goat / !

Spotted Bat

A program of the Montana State Library's Natural Resource Information System operated by the University of Montana.

http://mtnhp.org/SpeciesOfConcern/?AorP=a

Lynx canadensis Canada Lynx		Myotis lucifugus	Little Brown Myotis	Myotis thysanodes Fringed Myotis		Sorex preblei	Prebles Shrew	Ursus arctos Grizzly Bear	
Cats		Vespertitionidae	Bats	Vespertilionidae Bats		Soricidae	Shrews	Ursidae Bears	
S	Species Occurre	63	Species Occurrences verified in Hathead, Gallatin, Garfield, Glac Petroleum, Philips, Pondera, Pau Wheatland, Wibaux, Yellowstone State Rank Reagn: Species in the populations of this species in the	G4	Species Occurre Judith Basin, Lak State Rank Reas threats to persist	64	Species Occurre Madison, Missouli State Rank Reas	64	Species Occurre
ю	nces verified in t	53	Species Occurrences verified in these Cour Flathead, Gallatin, Garfield, Glador, Golden Petroleum, Philips, Pondera, Powder River, Wreatinod, Wilbaux, Yollowstone Wreatinod, Wilbaux, Yollowstone State Rank Reason: Species is common and populations of this species in the eastern US	ES.	nces verified in t ie, Lewis and Clari on: Although this lence from White-	53	nces verified in to a. Phillips, Powell an: Observations	\$253	nces verified in t
H) CH	hese Countles: C		hese Countles: Beer, Golden Valley, der River, Powell, irnon and widespr		hese Counties: Bu k, Lincoln, Madiso species is distribu Nose Syndrome ar		hese Counties: Bu . Ravalli, Sheridar of this species are	PS: LT; XN	hese Countles: Bo
Threatened on Forests (BD, BRT) Threatened, Critical Habitat on Forests (CG, HLC, KDOT, LDLD)	Species Occurrences verified in these Counties: Carbon, Flathead, Gallatin, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Missoula, Park, Pondera, Powell		Species Occurrences werified in these Counties: Beaverhead, Big Horn, Blaine, Braadwater, Carbon, Carter, Cascade, Choutesu, Custer, Daniels, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Galletin, Garffeld, Gladeer, Galdem Yalley, Grantle, Hill, Jefferson, Judith Bash, Lake, Lewfs and Clark, Lincoln, Madison, McCone, Meagher, Mineral, Miscolla, Musselbiell, P. Perrolem, Phillips, Pondern, Brandern, Powder River, Fowell, Prairie, Pavalli, Richland, Rocewell, Rocebud, Sanders, Sherdan, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Vall Wheaton, Victionschoe. Wheatond, Whaus, Yellowschoe. State Rank Reason: Species to common and widespread, but under significant threat of catastrophic declines due to Whitz-Nose Syndrome, a fungal disease responsible for the collapse populations of this species in the eastern U.S.		Species Occurrences verified in these Counties: Beaverhead, Big Hom, Blaine, Broadwater, Carbon, Carter, Cascade, Custer, Deer Lodge, Fergus, Flathead, G Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Miscolla, Provide Brier, Provell, Prairie, Ravalli, Roobad, Sanders, Silver Bow, Teckn, State Bank, Beason, Hidrough this gedeles is distributed across much of Montana, resent surveys have found to be uncommon within mage. Species occasional threats to persistence from White-Mose Syndrame are a concern, but due to its western distribution the extent of Impacts are as yet unknown.		Species Occurrences verified in these Counties: Deaverhead, Big Horn, Chouteau, Dawson, Deer Lodge, Fergus, Gallatin, Golden Valley, Granite, Judith Basin Maddon, Missoda, Phillips, Powell, Ravalli, Steridan, Sliver Bow, Swied Grass, Teson, Valley, Wheatland State Rank Basson, Deborathors of this species are informent remarks in the land to a severe themse. Consider may only broad occurs of a basid like and in one	Threatened on Forests (BD, CG,	eaverhead Carbon Cass
THREATENED	n, Glacier, Granite, La		iine, Broadwater, Cari , Judith Basin, Lake, I ed, Roosevelt, Rosebuc nt threat of catastropi	SENSITIVE	ine, Broadwater, Carl ssoula, Powder River, ana, recent surveys h Its western distributi		outeau, Dawson, Deer ss, Teton, Valley, Wh	THREATENED	arle Chruteau Deer
SGCN3	ike, Lewis and Clark, Lir	SGCN3	oon, Carter, Cascade, Cl ewis and Clark, Lincoln I, Sanders, Sheridan, Sil is declines due to Whit	SGCN3	oon, Carter, Cascade, C Powell, Prairie, Ravalli, ave found it to be unco on the extent of impacts	SGCN3	Lodge, Fergus, Gallatin satland	SGCN2-3	ada Dathard Callan
134	rcoin, Missoula, Pa	3%	houteau, Custer, D., Madison, Mccone, Mccone, Stillwater Pow, Stillwater Syndrome,	300	uster, Deer Lodge, Rosebud, Sanders, ramon within range s are as yet unknow	28%	, Golden Valley, G	12.	in, Glacier, Granite
40%			aniets, Dawson, Deer , Meagher, Mineral, A r, Sweet Grass, Tetor a fungal disease resp	64%	Fergus, Flathead, Ga., Silver Bow, Teton, T., Species occasionally m.	79%	ranite, Judith Basin,	22%	Species Occurrences verified in these Counties: Beaverhead, Carbon, Cascade, Chouteau, Deer Lodge, Flathead, Galiatin, Glader, Granite, Jefferson, Lake, Le
Subalpine confler forest	Stillwater, Sweet Grass, Teton	Generalist	Species Occurrences verified in these Counties: Bosverhosd, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Galletin, Galfield, Glacier, Goldem Yalley, Granitz, Hill, Jefferson, Judith Basin, Lake, Levis and Clark, Lincoln, Madison, Mccore, Meagher, Mireral, Miscodia, Musselsiell, Park, Pertudenn, Philips, Pamelern, Provider Biver, Foreil, Farier, Ravalli, Richland, Rocevelt, Rocebud, Sanders, Sherdan, Silver Bow, Stilventer, Sweet Grass, Teton, Toole, Treasure, Valley, Wheaton, Whatau, Yellowstone Wheatond, Whatau, Yellowstone State Ranik Reason: Species in the eastern U.S.	Riparian and dry mixed conifer forest	Species Occurrences verified in these Counties: Beaverlead, Big Horn, Blaine; Broadwater; Carbon, Carter; Cascade; Custer; Deer Lodge; Fergus; Flathead; Gallatin, Granite; Jefferson; Judith Basin, Lake; Lewis and Clark, Lincoln, Abdison, Meagher, Microlla, Powder Berker; Powell; Printje; Bavalli, Boobad; Sanders; Silver Bow, Tecon, Treasure State Rank Reason; Although this godies is distributed across much of Mantana; resent surveys have found it to be uncommon within mage. Species occasionally uses caves to over-winter so threats to persistence from White-Rose Syndrome are a concern, but due to its vestern distribution the extent of Impacts are as yet unknown.	Sagebrush grassland	Species Occurrences verified in these Counties: Deaverhead, Big Horn, Chouteau, Dawson, Deer Lodge, Fergus, Gallatin, Golden Valley, Granite, Judith Basin, Lewis and Clark, Lincoln, Maddion, Missoula, Phillips, Powell, Ravalli, Sheridan, Sleve Bow, Sweet Grass, Tecon, Valley, Wheatland State Rank Basson Chenrybing of this crackes are fully informer trends in large for the states through the same document of the best of the same states that the same states are same and the same states and the same states are same states are same states and the same states are same states are same states and the same states are same states and the same states are same states and the same states are same states are same states and the same states are same states and the same states are same states are same states are same states and the same states are same states and the same states are same states and the same states are same states are same states are same same states are same states are same states are same same states are same states are same states are same same states are same same same same same same same sam	Conffer forest	Lewis and Clark, Liberty.

	Aquila chrysaetos Golden Eagle		Anthus spragueii Sprague's Pipit.	MOI CHEFT GOONGWA	Accipiter gentilis	SCIENTIFIC NAME COMMON NAME TAXA SORT	BIKUS (AVES)
	Accipitridae Hawks / Kites / Eagles		Motacillidae Pipits	nawks / Nices / Eagles	Accipitridae	FAMILY (SCIENTIFIC) FAMILY (COMMON)	
Species Occurrences Gallatin, Garfield, Gt Phillips, Pondera, Pov Wibaux, Yellowstone	S	Species Occurrences verificant Lewis and Clark, Liberty, M Valley, Wheatland, Wibaux State Rank Reason: Althouter from covertype conversion.	6364	Species Occurren Basin, Lake, Lewis Teton, Wheatland	GS	GLOBAL	
Clacier, Golde Powder River, I	8	ices verified in Liberty, Madison d, Wibaux on: Although pop priversion, overg	538	s and Clark, Libe	53	STATE	
n Valley, Granite, Hill vowell, Prairie, Ravall	BGEPA; MBTA; BCC17	these Counties: Blain , Mccone, Meagher, M sulation trends in Mont razing, exotic plant in	MBTA; BCC11; BCC17	these Counties: Beav erty, Lincoln, Madison	MBTA	uspws	
erhead, Big Horn, Bl , Jefferson, Judith B i, Richland, Rooseve		ussetshell, Park, Pet ussetshell, Park, Pet tana appear to be re wasions, altered fire		erhead, Big Horn, Br , Meagher, Mineral,		uses	
aine, Broadwater, Car Jasin, Lake, Lewis and It, Rosebud, Sanders,	SENSITIVE	Chouteau, Custer. Dai troleum, Phillips, Pond datively stable in rece regimes, and mowing	SENSITIVE	roadwater, Carbon, Ca Missoula, Park, Ponde		MOIS	
Species Occurrences verified in these Counties: Beavenhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawzon, Deer Lodge Collation, Genfield, Glacier, Golden Walley, Granite, Hill, Jefferson, Jodith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Mccone, Meagher, Missoulia, Phillips, Pondera, Pewder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sherfdan, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, "Whbaux, Yelfonstone	SGCN3	Species Occurrences verified in these Counties: Blaine, Carter, Cascade, Criouteau, Custer, Daniels, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacker, Go Lewis and Clark, Liberty, Madison, McCone, Meigher, Musschhell, Park, Petroleum, Phillips, Pondera, Prairie, Richland, Roosevelt, Rozebud, Sheridan, Sciliwa Valley, Witheatland, Wibaux. State Rank Reason: Authough population trends in Montana appear to be relatively stable in recent years, populations have been in decline over the long run from covertype conversion, overgrazing, exotic plant invasions, altered fire regimes, and mowing prior to Resigning of young.	SGCN3	rter, Cascade, Deer Lo ra, Powder River, Powe	SGCN3	FWP SWAP	
Chouteau, Custer, Da , Madison, Mccone, M tillwater, Sweet Grav	3%	Fergus, Gallatin. Gari Roosevelt, Rosebud, ave been in decline o ung.	18%	dge, Fergus, Flatheau sll. Ravalli, Rosebud,	2%	N OF GLOBAL BREEDING RANGE IN AT	COUNTY - GALLATIN paged on
	100%	Sheridan, Stillwater, wer the long run and	67%	d, Gallatin, Glacier, G Sanders, Silver Bow, S	789	N OF ATTHAT IS BREEDING RANGE	deu to pated 1181
e, Fallon, Fergus, Flathead, , Musselshell, Park, Petroleum, Treasure, Valley, Wheatland,	Grasslands	Species Occurrences verified in these Counties: Blaine, Carter, Caccade, Chouteau, Custer; Daviels, Dawson, Falton, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Judith Basin, Levis and Clark, Liberty, Madison, Accore, Meagher, Museichell, Park, Petroleum, Philips, Procidera, Prairie, Richland, Rosebud, Sterdam, Stillwater, Sweet Grass, Teton, Toole, Valley, Winestand, Wibaux State Bank Reason: Although population trends in Montana appear to be relatively stable in recent years, populations have been in decline over the long run and the species faces threats from covertype conversion, overgrazing, exotic plant invasions, altered fire regimes, and mowing prior to fleeging of young.	Grasslands	Species Occurrences verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Carbor, Carcodo, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Granite. Jefferson, Judith Basin, Lade, Lewis and Clark, Liberry, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powder River, Powell, Ravalli, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Mhaadland	Mixed confer forests	нлытат	29 SPECIES

Ardea herodias Ardeidae		Artemisiospiza Passerellidae nevadensis New World Sparrows	Sagebrush Sparrow	Athene cunicularia Strigidae Burrowing Owl Owls		Buteo regalis Accipitridae Ferruginous Hawk Hawks / Kites		us fuscescens	veery	Centrocercus Phasianidae urophasianus Upland Game Birds Greater Sage-Grouse		cana	brown Creepers Creepers	tes	vespertinus	Evening Grosbeak		beak Pericanus Cuckoo	
Corner /	Herons / Night-Herons	dae Sparrows				Accipitridae Hawks / Kites / Eagles				me Birds		.0		ē					
65	Gallatin, Garfield, Gil Petroleum, Phillips, P Wibaux, Yellowstone State Rank Reason: S	65	Species Occurre	Ď.	Species Occurre Golden Valley, H Teton, Toole, Tri State Rank Reas	64	Species Occurre Valley, Hill, Jeffa Stillwater, Teton	65	Species Occurre Hill, Jefferson, L Roosevelt, Roseb	6364	Species Occurre Valley, Hill, Madi Yellowstone	65	Species Occurren Jefferson, Judith I Teton, Wheatland	65	Species Occurre Basin, Lake, Lew Wheatland	G5	Species Occurre	Ce	Species Occurre
13	d, Glacier, Golder ps, Pondera, Pow tone on: Small breedin	538	nces verified in t	538	nces verified in I III. Jefferson, Lev easure, Valley, W on: Specles has a	865	nces verified in t erson, Judith Basi , Toole, Valley, V	538	nces verified in take, Lewis and Ci ud, Sanders, Silve	52	nces verified in t	ES	nces verified in t Basin, Lake, Lew d	53	nces verified in t	S3B	nces verified in t	659	near warfflad in t
MBTA	Valley, Granito, I der River, Powell,	MBTA; BCC10; BCC17	hese Counties: Bo	MBTA; BCC17	Species Occurrences verified in these Counties: Beave Sodden Valley, Hill, Jefferson, Lewis and Clink, Liberty, Feton, Toole, Treasure, Valley, Wheatland, Yellowstone State Rank Reason: Species has a negative short-turm p	MBTA; BCC10; BCC17	Species Occurrences verified in these Counties: Beaverhead, Bla Valley, Hill, Jefferson, Judith Basin, Lewis and Clark, Liberty, Mad Stillwater, Teton, Toole, Valley, Wheatland, Wibaux, Yellowstone	MBTA	hese Counties: Be ark, Liberty, Linco er Bow, Stillwater,		hese Counties: Be igher, Musselshell,	MBTA	hese Counties: Be	MBTA	hese Counties: Bo oln, Madison, Alcay	PS: LT; MBTA;	hese Counties: 8	MOTA	hese Countles: Be
	Sevene social ences we need in these contracts, beginning from Johanns, patasware, Jahoni, Latter, Lessade, Undersad, Latter, Needs Long, Gallatin, Garffeld, Galletin, Garffeld, Galletin, Garffeld, Garfer, Madbon, Kocoe, Mengler, Michael J. Retrolletin, Garfeld, Lebery, Lincath, Addbon, Kocoe, Mengler, Michael J. Retrolletin, Garfeld, Franker J. Retrolletin, Garfeld, Sevender, Serfdan, Silver Bow, Stillwater, Sweet Grass, Tet Wilson, Tether Sevender, Retrolletin, Garfeld, Sevender,		Species Occurrences verified in these Counties: Beaverhead, Carbon, Gallatin, Meagher, Park, Ravalli	Sensitive - Known on Forests (CG) Sensitive - Suspected on Forests (HLC)	Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouleau, Custer, Davison, Felio, Golden Yalley, Hill, Jefferson, Lewis and Clark, Liberty, Madison, Mccone, Mussedbiell, Petroleum, Phillips, Fonders, Fowder Biver, Prairie, Ravalli, Roosevelt, Teton, Toole, Treasure, Valley, Wheatland, Yellowstone State Rank Reason; Specied Na. a negative short-term oppulation trend:		averhead, Blaine, Broa Liberty, Madison, Mcc Yellowstone		Species Occurrences verified in these Counties Reventeds, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Fergus, Plathes Hill, Jefferson, Lake, Levist and Clark, Liberty, Lincoln, Auddon, Accore, Awagber, Almend, Missoula, Ausselohell, Farit, Petroleum, Phillips, Fondern, Powder Roosevelt, Roodbud, Sandern, Silver Bow, Stillwater, Sweet Grass, Tedon, Whealtand, Yelfowstore	Sensitive - Known on Forests (BD) Sensitive - Suspected on Forests (CG, HLC)	Species Occurrences verified in these Counties: Deaverhead, Big Hom, Blaine, Broadwater, Carbon, Carter, Choussau, Custer, Dawson, Deer Lodge, Fallon, Valley, Hill, Addison, Accone, Aeagher, Assaciabeti, Park, Petroleum, Philips, Powder River, Praine, Rosebud, Silver Bow, Stilwater, Sweet Grass, Treasure, Yellowstone	The second	Species Occurrences verified in these Counties: Besvenhead, Brashhater, Carison, Carrer, Coscade, Choutesu, Deer Lodge, Fergus, Flathead, Gallatin, Glaci Jefferson, Judith Basin, Laic, Lewis and Clark, Lincoln, Madison, Mesgher, Mineral, Missoula, Park, Fowder River, Fowell, Ravalli, Rosebud, Sanders, Silver Bo Teton, Wheatland		averhead, Broadwater, gher, Mineral, Missoula,	G5 S38 PS: LT; M8TA; Threatened on SENSITIVE SGCN3; SGIN 1% 50%	Species Occurrences verified in these Counties: Big Horn, Carbon, Carbon, Carbon, Custer, Gallatin, Lake, Madison, Missoula, Phillips, Powder River, Richia		averhead. Big Horn, Bla
	asin, Lake, Lewis and only Roosevelt, Rosebuc	SENSITIVE	atin, Meagher, Park, F	SENSTTIVE	aine, Broadwater, Carl Ausselshell, Petroleum	SENSITIVE	dwater, Carter, Casca one, Meagher, Mussels	SENSITIVE	aine, Broadwater, Cart eagher, Mineral, Misso heatland, Yellowstone	SENSITIVE	sine, Broadwater, Cart ps, Powder River, Prai		Carbon, Carter, Casca Mineral, Missoula, Park		Carbon, Carter, Casca Musselshell, Park, Fon	SENSITIVE SEPREMENTAL SENSITIVE	Chouteau, Custer, Ga		vina Renadwater Cart
SGCN3	Clark, Liberty, Lincoln, Clark, Liberty, Lincoln, S, Sanders, Sheridan, S	SGCN3	bavalli	SGCN3	oon, Carter, Cascade, (, Philitips, Pondera, Po	SGCN3	de, Chouteau, Custer, hell, Park, Petroleum,	SGCN3	on, Cascade, Choutea ula, Musselshell, Park,	SGCNZ	oon, Carter, Chouteau, rie, Rosebud, Silver Bo	SGCN3	de, Chouteau, Deer Lo , Powder River, Powel	SGCN3	ide, Chouteau, Fergus, idera, Powder River, Po	SGCN3, SGIN	llatin, Lake, Madison, /	- Common	on Carter Cascade C
3%	Madison, Mccone, Milver Bow, Stillwater,	200		2%	Chouteau, Custer, Da wder River, Prairie, R	71%	Daniels, Dawson, Fall Phillips, Pondera, Po	6%	u, Custer, Deer Lodge Petroleum, Phillips,	17%	Custer, Dawson, Dee	**	idge, Fergus, Flathea I., Ravalli, Rosebud, S	3%	Flathead, Gallatin, Cowell, Ravalli, Sander	e causes of these de	Missoula, Phillips, Po	2	houreau Custer Da
100%	eagher, Mineral, Mis Sweet Grass, Teton	13%		82%	wson, Fallon, Fergus availl, Roosevelt, Ro	%5e	on, Fergus, Gallatin wder River, Prairie,	100%	e, Fergus, Flathead, Pondera, Powder Rt	75%		53%	d, Gallatin, Glacier, anders, Silver Bow,	100%	Slacier, Golden Vallers, Silver Bow, Stillw		wder River, Richland	-	niels, Dawson, Fallor
Riparian forest	Service occurrences we meet in these contract, parent planer, planer, about, latter, laborat, catcal, choldent, cutter, jamon, beet Longe, Fallon, tergis, Flathead, Gallath, Carlfeld, Gallath, Carlfeld, Gallath, Addison, Accord, Meagher, Mercel, Massach, Massachell, Falk, Park, Particulaum, Phillips, Pondera, Powder River, Powell, Frairie, Ravalli, Richland, Roosevelt, Rosebud, Sandera, Sherfoan, Silver Bow, Stillwater, Sweet Grass, Teton, Treasure, Valley, Wheattand Whitaux, Yellowstone	Sagebrush		Grasslands	Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blahe, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Davison, Faltor, Fergus, Callatin, Garfried, Glacier, Golden Yalley, Hill, Jeffeson, Lewis and Clark, Liberty, Madison, Mccone, Musselshell, Petroleum, Phillips, Ponders, Powder Biver, Prairie, Ravalli, Rossavelt, Bosebusi, Sheridan, Stillwater, Teton, Toole, Treasure, Valley, Wheatland, Yellowstone State Rank Reason; Specied has a negative short-turn population trand.	Sagebrush grassland	Species Occurrences verified in these Counties: Beiverhead, Blaine, Broadwater, Carter, Cascade, Choutesu, Custer, Daviels, Davizon, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Volley, Hill, Jefferson, Judith Basin, Levis and Clark, Liberty, Modison, Mccone, Mespher, Muzadsbell, Park, Petroleum, Phillips, Pondera, Powder River, Prairle, Roosevelt, Rosebud, Sheridan, College, Total, Took, Valley, Hill, Jefferson, Judith Basin, Levis and Clark, Liberty, Modison, Mccone, Mespher, Muzadsbell, Park, Petroleum, Phillips, Pondera, Powder River, Prairle, Roosevelt, Rosebud, Sheridan, Charles, Carter, Total, Took, Valley, Valley, Language, Carter, Total, Took, Valley, Valley, Valley, Alley, Carter, Total, Took, Valley, Valley, Valley, Alley, Carter, Total, Took, Valley, Valley, Valley, Carter, Total, Took, Valley, Valle	Riparian forest	Species Occurrences verified in these Counties: Resverhead, Big Horn, Blaine, Broadwater, Cabon, Cascade, Chouteau, Custer, Deer Lodge, Fergus, Flathead, Gallatin, Glacter, Granties, Hill, Jefferson, Lake, Levis and Clark, Liberty, Lincoln, Audison, Accore, Awagher: Almend, Assoula, Ausseldnell, Fank, Petroleum, Phillips, Fondern, Powder Rher, Powell, Ravalli, Richard, Roosevall, Roosevall, Sankers, Silver Bow, Stillwater, Sweet Grass, Teorph, Whatland, Yellowstone.	Sagebrush	Fergus, Gallatin, Garfield, Golden Valley, Wheatland, Wibaux,	Maist conifer forests	Species Occurrences verified in these Counties; Besvenheid, Braidwater, Carbon, Carter, Cascade, Choureau, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Mesgher, Mindral, Missoula, Park, Fowder Biver, Fowell, Ravalli, Rozebud, Sanders, Silver Bow, Silliwater, Sweet Grass, Teton, Wheatland	Conifer forest	Species Occurrences verified in these Counties: Bosvenhood, Broadwater, Carbon, Carter, Coscade, Choutesu, Fergus, Flathead, Gallatin, Glasfer, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lowis and Clark, Lincolin, Madison, Meagher, Mineral, Missoulai, Musselshell, Park, Fondera, Powdel, Ravalli, Sanders, Silver Bow, Sillwater, Sweet Grats, Tetorn, Wheatland	(Bonter and Harvey 2008). Prairie riparian forest	ind, Rosebud, Stillwater, Wibaux		species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Castade, Chouteau, Custer, Daniels, Dawson, Salton, Former, Datheyd, Gallatin

Pleated Woodpecker Wo	Falco peregrinus Falc Peregrine Falcon Fal				Pinyon Jay	cassinif	Cassin's Finch Fine	icanus	Black-necked Still Avo	ius	Varied Thrush Thr	Lanius Iudovicianus Laniida Loggerhead Shrike Shrikes		Nucifraga columbiana Con Clark's Nutcracker Jaya		Numenius americanus Scol Long-billed Curlew San		Oreoscoptes montanus Mimidae Sage Thrasher Thrasher	Moc	Picoides arcticus Picidae Black-backed Woodpecker Woodpe
Woodpeckers	Falconidae Falcons			Corvidae	Jays / Crows / wagpies	Fringillidae	Finches	Recurvirostridae	Avocets	Turdidae	Thrushes	Lanfidae Shrikes		Corvidae Jays / Crows / Magples		Scolopacidae Sandpipers		Nimidae Thrashers /	Mockingbirds / Catbirds	Woodpeckers.
Species Occurre	č	Coarder Occurs	Species Occurre Lewis and Clark,	8	Species Occurre Clark, Musselshe	65	Species Occurre Granite, Jefferso Silver Bow, Stilly Stare Bank Beach	65	Species Occurre	65	Species Occurrences verified in Mineral, Missoula, Park, Pondera State Rank Reason: The Varied I loss of suitable breeding habitat.	G4	Species Occurre Glacier, Golden 1 Stillwater, Sweet	65	Species Occurre Valley, Granite, . Ravalli, Sanders,	GS	Species Occurre Flathead, Gallati Phillips, Pondera Yellowstone	64	Species Occurrer Madison, Mussels	8
nces verified in t	23	Description of the s	Lincoln, Madison,	53	nces verified in t	53	nces vertified in t n, Judith Basin, L ater, Sweet Grass	538	nces verified in t	538	nces verified in t , Park, Pondera, I on: The Varied Th reeding habitat.	538	rate, Hill, Jeffer Grass, Teton, To	S	nces verified in the lefferson, Judith I Silver Bow, Stillw	828	nces verified in ti n, Garfield, Glack Powder River, Po	\$38	nces verified in the	3
MBTA hese Counties: Be	G4 53 DW; MBTA; Sensitive - Kno BCC10; BCC11; on Forests (B BCC17 K007; LO,EU.		Meagher, Mineral	MBTA; BCC17	hese Counties: Bi n, Phillips, Powder	MBTA; BCC10	Species Occurrences verified in these Counties: Bewerhead, Big H Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Uncoln, Max Silver Jow, Stillwater, Sweet Grass, Teton, Wriesdland, Yellowstone State Basik Bason, This thou warent their dealload.	MBTA	hese Countles: Ca	MBTA	Species Occurrences verified in these Countles: Broadwater, Co Mineral, Missoila, Park, Pondera, Powell, Bavalli, Sanders, Teton State Rank Reason: The Varied Thrush has undergone recent pop- loss of sultable breeding habitat.	MBTA; BCC10; BCC17	hese Countles: Be son, Liberty, Madi ole, Valley, Wheat	MBTA	hese Counties: Be Basin, Lake, Lewis ater, Sweet Grass,	MBTA; BCC10; BCC11; BCC17	Species Occurrences verified in these Counties: Beaverhead, Big Flathead, Gallatin, Garlfeld, Glacier, Golden Valley, Granite, Hill, Phillips, Ponders, Powder River, Fowell, Prairie, Ravalli, Richand, Yellowstone	MBTA; BCC10; BCC17	hese Countles: Be	MBTA
eaverhead, Broadwater,	Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)		Spacles Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Deer Lodge, Flathead, Gallatin, Lewis and Clark, Lincoln, Madison, Megiter, Mineral, Miscola, Park, Pondera, Powell, Prairie, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton,		Species Occurrences verified in these Counties: Big Hom, Blaire, Broadwater, Carton, Carter, Cascado, Chouteau, Custer, Fergus, Gallatin, Garfield, Gol Clark, Musselshell, Park, Petroleum, Phillips, Powder River, Rosebud, Stillwater, Sweet Grass, Wheatland, Yellowstone		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Cascado, Chouteau, Custer, Deer Lodge, Fergus, Flathead, G Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Abadson, Meagher, Mineral, Missoula, Mussethell, Park, Petroleum, Philips, Powder River, Silver Bow, Stillwater, Sweet Grass, Feton, Witestland, Vollowstone		Species Occurrences verified in these Counties: Cascade, Chouteau, Gallatin, Glader, Golden Valley, Lake, Lewis and Clark, Missoula, Phillips,		Species Occurrences verified in these Counties: Broadwater, Cascade, Flathead, Gallatin, Glacier, Golden Valley, Granite, Judith Basin, Lake, Lewis and Marcal, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Teton State Rank Reason: The Varied Thrush has undergone recent population declines in Nontana and across the Northern Rockies and where timber harvest, in loss of salfable breeding habitat.		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blahre, Broadvater, Carbon, Carter, Cascade, Chouteau, Custer, Daniets, Dawson, Glader, Golden Valley, Hill, Jefferson, Liberty, Madison, Accore, Mesgin, Mostethell, Petroleum, Phillips, Pondera, Powder River, Prairie, Richland, Roos Calliwater, Sweet Grass, Tetom, Tode: Valley, Wheatland, Whitaux, Velloyetce	Species of Conservation Concern on Forests (FLAT)	Species Occurrences verified in these Counties: Beaverhead, big Horn, Braadwater, Carbon Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clais, Liberty, Livotin, Madison, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Wheatland, Yellowstone		Species Occurrences verified in these Counties: Beaverhead, Big Hom, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Davoon, Flathead, Gallutin, Garfield, Glacker, Golden Valley, Grantie, Hill., Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Madison, Mccore, Meagher, Misso Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sandern, Sheridan, Scillwater, Sweet Grass, Telon, Toole, Treasure, Vallowstone		Species Occurrences verified in these Guntles: Beaverhead, Big Horn. Broadwater, Carbon. Carter, Chouteau, Custer, Fallon, Gallacin, Garfield, Golden Madison, Mussethell, Park, Petroleum Phillips, Powder River, Prätie, Richland, Ronebud, Sanders, Sliver Row, Stillwater, Suwer Gross, Valley, Wheestand	Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)
Cascade, Deer Lodge,	SENSITIVE		alne, Broadwater, Carb a, Powell, Prafrie, Rav		iter, Carbon, Carter, C iter, Sweet Grass, Whe		oadwater, Carbon, Cas eagher, Mineral, Misso		tin, Glacier, Golden Va		thead, Gallatin, Glacie tines in Montana and a	SENSITIVE	ilne, Broadwater, Carb Musselshell, Petroleum one		adwater, Carbon, Cart oin, Madison, Meagher nd, Yellowstone	SENSITIVE	ine, Bruadwater, Carb , Judith Basin, Lake, L. t, Rosebud, Sanden, Si	SENSITIVE	adwater, Carbon, Cart	SENSITIVE
SGCN3 Flathead, Gallatin, Gla	SGCN3		on, Cascade, Chouteau valli, Sanders, Silver Box	SGCN3	ascade, Chouteau, Cust eatland, Yellowstone	SGCN3	cade, Chouteau, Custer ula, Musseishell, Park, I	SGCN3	alley, Lake, Lewis and C	SGCN3	er, Golden Valley, Grani Ecross the Northern Rock	SGCN3	on, Carter, Cascade, Ch 1, Phillips, Pondera, Pov	SGCN3	ter, Cascade, Chouteau r, Mineral, Missoula, Mu	SGCN3	on, Carter, Cascade, Ch ewis and Clark, Liberty, heridan, Stillwater, Swe	SGCN3	Silver Bow Stillwater	SGCN3 .
1% der, Granite, Jeffe	2%		Deer Lodge, Flath	5%	er, Fergus, Gallati	11%	Deer Lodge, Ferg etroleum, Phillips	50	lark, Missoula, Phil	蒙	te, Judith Basin. Li	â	outeau, Custer. Do Ider River, Prairie.	3%	Custer, Deer Lodg Iselshell, Park, Pet	19%	outeau, Custer, Da Madison, Mccone, et Grass, Teton, Ti	3.6	allon, Gallatin, Ga	2%
27% erson, Lake, Lewis an	100%			55%	n, Garffeld, Golden V	62%	us, Flathead, Gallati Powder River, Powe	200	lips, Ravalli, Stillwat	37%	ake, Lewis and Clark, ber harvest, insect o	100%	Richland, Roosevelt	84.8	je, Fergus, Flathead, roleum, Phillips, Pon	100%	iriets, Dawson, Deer Meagher, Missoula, A pole, Treasure, Valle	84%		
GS SI MBTA Societ Occurrences verified in these Counties: Beaverhead, Broadwater, Cascade, Deer Lodge, Flathead, Gallath, Glacier, Granite, Jefferson, Lake, Levik and Clark, Uncoln, Madison,	Cliffs / canyons		Glacier, Granite, Jefferson, Lake, Toole, Treasure, Yellowstone	Open conifer forest	den Valley, Jefferson, Lewis and	Drier conifer forest	Species Occurrences verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Cascale, Chouteau, Custer, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips. Fowder River, Powell, Ravalli, Rozebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheelshof, Veilorstone	Wetlands	Ravalli, Stillwater, Teton, Yellowstone	Moist conifer forests	Species Occurrences verified in these Counties: Broadwater, Cascade, Flathead, Gallatin, Glacier, Golden Valley, Granite, Judith Basin, Lake, Lewfs and Clark, Lincoln, Madison, Meagher, Mahreal, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Teton State Rank Reason: The Varied Thrush has undergone recent population declines in Montana and across the Northern Rockies and where timber harvest, insect outbreak, and fire result in a loss of salfable breeding habitat.	Shrubland	Fallon, Fergus, Gallatin, Garffeld, evelt, Rosebud, Sheridan,	Conifer forest	Species Occurrences verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Deer Lodge, Fergus, Flathead, Caliatin, Glacier, Goldon Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoh, Madison, Mespier, Mineral, Missoula, Masselsnell, Bark, Petroleum, Phillips, Pondera, Powdel River; Powell, Baroll, Sanders, Shore Bow, Stillwater, Sweet Grass, Teton, Tode, Wheatland, Yeldowstone	Grasslands	Hom, Blaine, Brasdwater, Carbon, Carter, Cascade, Chouteau, Cinter, Daviets, Davson, Deer Lodge, Fallon, Fergus, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Madison, Mccone, Neugher, Missoula, Mussakshell, Park, Petroleum, Roosevelt, Rosebud, Sanders, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux,	Sagebrush	Valley, Jefferson, Lewis and Clark,	Conifer forest burns

	Anaxyrus boreas Western Toad
	Bufonídae True Toads
Species Occurren Meagher, Mineral, Meagher, Mineral, State Rank Reaso occupancy appear remain from conti	ହ
Species Occurrences verified in these Counties: Bowerhead, Chotteau, Deer Lodge, Flathead, Gallatin, Glacies Neagher, Alberal, Miscoula, Park, Pondera, Powell, Ravalli, Sanders, Sliver Bow, Teton Neagher, Miscoula, Park, Pondera, Powell, Ravalli, Sanders, Sliver Bow, Teton State Rank Reason: Over the last few decades this species has undergone serious declines in abundance due print State Rank Reason: Over the last few decades this species has undergone serious declines in abundance due print Scate Rank Reason: Over the last few decades, changes to abundance across the species range without Coccupancy Japones to have stabilized in the last decade, changes to abundance across the species range without remain from continued impacts of disease and mornality of adults and voune during to breeding and local minarties.	ß
Species Occurrences verified in these Counties: Beaverhead, Chouteau, Deer Lodge, Flathead, Gallatin, Glacler, Granite, Jefferson, Judith Basin, Lake, Lewis a Meagher, Minrail, Mascula, Park, Bondera, Fowell, Ravaill, Sanders, Silver Bow, Teton State Rank Reason: Over the last few decades this species has undergone exflored sections in abundance due primarily to infection with Chytrid fungus. While decompany appear to have stabilized in the last decader, changes to abundance across the species range within Montana remain unknown. Significant threats to the concupancy appear to have stabilized in the last decader, changes to abundance across the species range within Montana remain unknown. Significant threats to the concupancy appear to have stabilized in the last decader, changes to abundance across the species range within Montana remain unknown. Significant threats to the	Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)
ter Lodge, Flathead, G low, Teton rrious declines in abun	SENSITIVE
allatin, Glacier, Granito dance due primarily to l	SGCNZ
e, Jefferson, Judith B Infection with Chytric	6%
Sasin, Lake, Lewis d fungus. While de ficant threats to t	38%
s and Clark, Lincoln, Madison, eclines in breeding site the persktence of this species	Wetlands, floodplain pools

Species Occurrences well-field in these Counties: Beavenhead, Broadwater, Cascade, Chodteau, Deer Lodge, Fergus, Flathead, Gallath, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Cities, Lincon, Hodger, Medger, Mineral, Missoula, Park, Prodera, Powell, Bavalli, Sanders, Silver Bow, Teton, Wheatland The Carlos Cascan, The Municipan Historica, Missoula, Park, Prodera, Powell, Bavalli, Sanders, Silver Bow, Teton, Wheatland The Carlos Cascan, The Municipan Historica Cascan, The Cascan,	er, Granite, Jefferson,	ithead, Gallatin, Glack reatland	eer Lodge, Fergus, Fla	Cascade, Chouteau, I ell, Ravalli, Sanders,	Species Occurrences verified in these Counties: Beaverhead, Broadwater, Cascade, Crioticau, Deer Lodge, Fergus, Rathead, and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Teton, Wheatland	hese Counties: B ver, Mineral, Miss	n, Madison, Meagl	and Clark, Lincol		
Mountain streams, rivers, lakes	34%		SGCNZ	SENSITIVE	Sensitive - Known on Forests (BD, BRT, CG, HLC, KOOT, LOLO)		B	G5T4	Salmonidae Trout	Oncorhynchus clarkii lewisi Westslope Cutthroat Trout
pulation numbers, range	tentially declining pop	ellowstone very limited and/or po	water, Sweet Grass, Ye it is at risk because of	Meagher, Park, Still in Montana because	Species Occurrences verified in these Counties: 189 Hom. Carbon, Gallatin, Meagher, Park, Sillivator, Sweet Grass, Yollowstone State Rank Beason: The Yellowstone Cutthroat trout is currently raihed 'SZ' in Montana because it is at risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to extingation in the state.	hese Counties: B ne Cutthroat trou le to extirpation	Species Occurrences verified in these Counties: Big Hom, Car State Rank Reason: The Yellowstone Cuthroat brout is current and/or habitat, making it vulnerable to extirpation in the state.	Species Occurre State Rank Reas and/or habitat, i		Trout
Mountain streams, rivers, lakes	12% #		SGCNZ	SENSITIVE	Sensitive - Known on Forests (CG)		23	6574	Salmonidae Trout	=
навтат	N OF AT THAT IS BREEDING RANGE	N OF GLOBAL BREEDING RANGE IN MT	FWP SWAP	BLW	USFS	USFWS	STATE	GLOBAL	FAMILY (COMMON)	SCIENTIFIC NAME COMMON NAME TAXA SORT
Bapped Spaces accommod	i based on mappe	COUNTY - GALLATH based on							11.00	

STONEFLIES	Boloria frigga Frigga Fritillary	BUTTERFLIES	Riffle Beetle	Zaitzevia thermae	Riffle Beetle	Microcylloepus browni Elmidae	BEETLES	COMMON NAME TAXA SORT	INVERTEBRATES - INSECTS
	Nymphalidae Brush-footed Butterflies		Kirie beetles	Elmidae	Riffle Beetles	Elmidae		FAMILY (SCIENTIFIC) FAMILY (COMMON)	INSECTS
	G5 Species Occurrenc		Species Occurrences verified in these Counties: Gallatin State Rank Reason: This riffle heelite is currently listed as to global extinction or extipation in the state. These warn Bridger: Creek Campon outside of Bozeman.	61	Species Occurrences verified in these Counties: Gallatin State Rank Reason: This rifite beetle is currently listed as to global extinction or extripation in the state. These warr Bridger Creek Canyon outside of Bozeman.	GI		GLOBAL	
	5152 es verified in the		es verified in the This riffle beetle or extipation in a on outside of Boze	51	es verified in the This riffle beetle or extirpation in on outside of Baze	15		STATE	
	re Countles: Beav		se Countles: Galla is currently listed the state. These w man.		se Counties: Galla is currently listed the state. These w man.			USFWS	
	G5 5152 Species Occurrences verified in these Counties: Beaverhead, Gallatin, Madison		atin das '\$1" in MT due to o varm-spring beetles au		atin d as "S1" in MT due to varm-spring beetles a			uses	
	ison		extremely limited an e generally endemic		extremely limited an			BLM	
			Species Occurrences writted in these counties: Gallatin State Bank Reason: This riftle heetic is currently listed as '51' in MT due to extremely limited and/or rapidity decibing population numbers, range and/or habit to global extinction or extipation in the state. These warm-spring beeties are generally endemic to only a few locations; this species is endemic to 1 known to Bridger Creek Caryon outside of Bozenian.		Species Occurrences verified in these Counties: Gallatin State Bank Reason: This rifle beelle is currently listed as '51' in MT due to extremely limited and/or rapidity declining population numbers, range and/or habi State Bank Reason: This rifle beelle is currently listed as '51' in MT due to extremely involved and/or rapidity declining population numbers, range and/or habi State Bank Reason: This rifle beelle is currently listed as '51' in MT due to extremely involved and/or rapidity declining population numbers, range and/or habi State Bank Reason: This rifle beelle is currently listed as '51' in MT due to extremely involved and/or rapidity declining population numbers, range and/or habi State Bank Reason: This rifle beelle is currently listed as '51' in MT due to extremely limited and/or rapidity declining population numbers, range and/or habi State Bank Reason: This rifle beelle is currently listed as '51' in MT due to extremely limited and/or rapidity declining population numbers, range and/or habi State Bank Reason: This rifle beelle is currently listed as '51' in MT due to extremely limited and/or rapidity declining population numbers, range and/or habi			dYMS dM.4	
			population numbers, i is; this species is ende	100%	population numbers, is; this species is ende	100%		% OF GLOBAL BREEDING RANGE IN MT	COUNTY - GALLATIN Ibased on
	12%		range and/or habitat, mic to 1 known locatic	100	range and/or habitat, mic to 1 known location	1%		% OF MT THAT IS BREEDING RANGE	Hi thesed on meer
	Montane wetlands		Species Occurrences writing in these Counties: Gallatin State Bank Reason: This riftle bestie is currently listed as '51' in MT due to extremely limited and/or rapidly decitining population numbers, range and/or habitals, making it highly vulnerable for global extinction or excitoation in the state. These warm-spring besties are generally andemic to only a few locations; this species is endemic to 1 known location, a warm springs in the Bridger Creek Canyon outside of Bozenian.	Springs	Species Occurrences verified in these Counties: Gallatin State Bank Reason: This rifle beetle is currently listed as '51' in MT due to extremely limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to global extinction or extipation in the state. These warm-spring beetles are generally endemic to only a few locations; this species is endemic to 1 known location, a warm springs in the Bridger Creek Canyon outside of Bozeman.	Springs		навтат	6 SPECIES

Passerellidae w New World Sparrows New World Sparrows Constitution Owls Troglodytidae	Green-tailed Towhee Green-tailed Towhee Psiloscops flammeolus Flammulated Owl	New World Sparrows Strigidae Owls	Species Occurre Basin, Lewis and State Rank Reas	clark, Madison, on: Populations	MBTA; BCC10	leaverhead, Big Horn, Bla leil, Park, Petroleum, Phi ross the Northern Rockies Sensitive - Known on Forests (BD,	2 4 5 7	ine, Broadwater, Cart lips, Powder River, Si have undergone rece SENSITIVE	Species Occurrences verified in these Counties: Seaverhead, Big Horn, Blaine, Broadwater, Cathon, Chouteau, Custer, D Basin, Lewis and Clark, Medison, Meagher, Musseishell, Park, Petroleum, Phillips, Powder River, Silver Bow, Stilwater, So State Blank Reason: Populations in Montana and across the Northern Rocket have undergone recent declines. G4 S3B MBTA; BCC10 Sensitive - Known SENSITIVE SCCN3	ne. Broadwater, Carbon. Chouteau, Custer, Deer Lodge, Fergus, C lips, Powder River, Silver Bow, Stillwater, Sweet Grass, Valley, Wi have undergone recent declines. SDISITIVE SGCN3 28	au, Custer, Deer Lo tillwater, Sweet Gra CN3
Passerellidae New World Sparrows Strigidae Owls Troglodytidae	Flammulated Owl		Ŷ	Si	WBTA; BCC10		SENSITIVE		SGCV3		K
Passerellidae New World Sparrows Strigidae Owis Troglodytidae						Concern on Forests (FLAT)					
Strigidae Owis Troglodytidae	Spizella breweri Brewer's Sparrow		Species Occurre	inces verified in	these Counties: Bo	Concern on Forests (FLAT) leaverhead, Broadwater,	Flathead, Gallatin, G		anite, Jefferson, Lake, I	anite, Jefferson, Lake, Lewis and Clark, Linc	ante, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Minora
Strigidae Owis Troglodytidae		Passerellidae New World Sparrows	Species Occurre Sanders	nces verified in	MBTA; BCC10;	Concern on Forests (FLAT) ceaverhead, Broadwater,	Flathead, Gallatin, Gi SENSITIVE	an	ite, Jefferson, Lake, I	Ite, Jefferson, Lake, Lewis and Clark, Linc SGCN3 12%	Ite, Jefferson, Lake, Lewis and Clark; Lincoln, Madison, Minera SGCN3 12% 100%
Troglodytidae		Passerellidae New World Sparrows	Species Occurre Sanders G5 Species Occurre Garfield, Glacie River, Powell, P State Rank Reas	sces verified in S3B	MBTA; BCC10; BCC17 these Countles: B Granite, Hill, Jeffe chland, Roosevelt, chland, Roosevelt, shreats from loss	Concern on Forests (FLAT) ceaverhead, Brosdwater, leaverhead, Big Horn, Bla eaverhead, Big Horn, Bla eaverhead, Lewis and C Rosebud, Sanders, Sheri of sagebrush habitats it	Flathead, Gallatin, G SENSITIVE SENS	@ a ≥ a m	nite, Jefferson, Lake, 1 5GCN3 5GCN3 4, Carler, Chouteau, Choiseau, Chouteau, Chouteau, Come, Meagleter, Sweet Grass, Teto suit of habitat conversi	nite, Jefferson, Lake, Lewis and Clark, Linc SGCN3 12% n, Carter, Chouteau, Custer, Dawson, Deer addison, Mccone, Meagher, Missoula, Muster ter, Sweet Crass, Teleny, Toole, Tressure, V suit of habitat conversion for agriculture ar	nite, Jefferson, Lake, Levifs and Clark, Lincoln, Madison, Minera SGCN3 12% 100% 100% Carler, Chouteau, Custer, Davson, Deet Lodge, Fallon, Ferguadion, Mccone, Meagher, Missoula, Musselbiell, Park, Petriloudion, Mccone, Meagher, Missoula, Musselbiell, Park, Petriloudion, Mccone, Meagher, Missoula, Musselbiell, Park, Petriloudion, Work, Sweet Crass, Teton, Toole, Treasure, Valley, Wheatland, Wuter, Sweet Crass, Teton, Toole, Treasure, Valley, Wheatland, Wuter, Sweet Crass, Teton, Toole, Tessure, Valley, Wheatland, Wuter, Sweet Crass, Teton, Toole, Toole, Tessure, Valley, Wheatland, Wuter, Sweet Crass, Teton, Toole, Toole, Tessure, Valley, Wheatland, Wuter, Sweet Crass, Teton, Toole, Tessure, Valley, Wheatland, W
Troglodytidae G5 S3	Strix nebulosa Great Gray Owl	Passerellidae New World Sparrows Strigidae Owis	Species Occurre Sanders G5 Species Occurre Garfield: Glacfe River, Powell, State Rank Reas encroachment a	S38 S38 S38 Roden Valley, Goden Valley, Tairle, Ravalli, Ri and Grought.	MBTA; BCC10; BCC17 these Countles: B Granite, Hill, Jeff Colland, Roosevelt, Chland, Roosevelt, s breats from loss MBTA	Concern on Forests (FLAT) leaverhead, Broadwater, leaverhead, Big Horn, Big saverhead, Big Horn, Big saverhead, Sanders, Strain of sagebrush habitats it	Flathead, Gallatin, Gi SENSITIVE Sensitive Evanguater, Carl dan, Kliberty, Lincoln, dan, Silver Ewa, Sensitive Ewa, Silver Ewa	8889 9	tte, Jefferson, Lake, I SGCN3 , Carter, Chouteau, C dison, Mccore, Meagl or, Sweet Grass, Teto At of habitat conversi	Ite, Jefferson, Lake, Lewis and Clark, Linc SGCN3 128 128 128 128 128 128 128 128 128 128	Ite, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Mincral, Missoula, Powell, Ravalli, 5GCN3 128 100% Sagebrush Carter, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Honore, Masgher, Missoula, Musselbell, Park, Petroleum, Phillips, Pondera, Powder F, Sweet Grass, Teton, Toole, Tressure, Valley, Mestaland, Missuux, Yellowstone Ir. Survey Crass, Teton, Toole, Tressure, Valley, Mestaland, Missuux, Yellowstone Ir. Survey Crass, Teton, Toole, Tressure, Valley, Mestaland, Missuux, Yellowstone Ir. Survey Conference of frequency of fire as a result of weed SSCN3, SGIN 28 Confer forest near open meadows
	Strix nebulosa Great Gray Owl	Passerellidae New World Sparrows Strigidae Owis	Species Occurry Sanders G5 Species Occurry Garfield, Glade River, Powell, P. State Bank Reas encroad/ment a G5 Species Occurre Park, Powell, River, Powell, River, Royell, River, Royell, River, River	sale, verified in sale, verified in c. Golden Valley, and drought.	these Counties: B MBTA; BCC10; BCC17 these Counties: B Grante, Hill, Jeffe Grante, Hill, Jeffe s threats from loss weet Grass; Tebs	Concern on Forests [FLAT] leavenhead, Broadwater, leavenhead, Big Horn, Blu eavenhead, Sanctern's snet of sagebrush habitats it of sagebrush habitats it of sagebrush habitats it.	Flathead; Gallatin, Gi SENSITIVE SENSITIVE Inc., Broadwater, Cart lark, Liberty, Lincoln, dan, Silver Bow, Silliu dan, Silver Bow, Silliu is dependent on as a SENSITIVE Lodge, Flathead, Gal	ante esuit	e, Jeffersen, Lake, J SGCN3 SGCN3 Carter, Chouteau, C Carter, Chouteau, C Carter, Croone, Meagl Sweet Crass, Tedo Sweet Crass, Tedo SGCN3, SGIN	e, Jefferson, Lake, Lewis and Clark, Line SGCN3 12% Carter, Chouteau, Custer, Dawson, Deer Son, Mccone, Meagher, Missoula, Musse, i Sweet Grass, Teton, Totle, Treasures, i of habitat conversion for agriculture an SGCN3, SGIN 2% SGCN3, SGIN 2%	e, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Mineral, Missoula, Powell, Ravi SGCN3 128 1008 Sagebrush 1008 Sagebrush Cutter, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Kson, Mccone, Meagher, Missoula, Muskelinel, Park, Fertileum, Phillips, Pondera, For Sweet Grass, Teton, Toole, Treasun, Walley, Myrethind, Whauer, Yellowstone, Sweet Grass, Teton, Toole, Treasun, Valley, Myrethind, Whauer, Yellowstone of habitat conversion for agriculture and increased frequency of fire as a result of w SGCN3, SGIN 26 SGCN3, SGIN 26 Conffer forest near of Readows SGCN3, SGIN 26 Conffer forest near of Readows SGCN3, SGIN 27 Conffer forest near of Readows SGCN3, SGIN Conffer forest near of Readows

Sandy / gravelly soils	66%	19%	SGCN3, SGIN	SENSITIVE	on Forests (CG) Sensitive Suspected on Forests (HLC)	hasa Counties: R	oces verified in t	Sensitive Known SENSITIVE SGCN3, SGIN 19% 66% Sandy / gravetly solts (C) Sensitive - Suppected on Forests (HC) Sensitive - Suppected on Forests (H	Sagebush / Spiny Lizards	hernandesi Greater Short-horned Lizard
навітат	BREEDING RANGE WOF MT THAT IS BREEDING RANGE	BREEDING RANGE IN MT	EWP SWAP	BLM	USFS	USEWS	STATE	GLOBAL	FAMILY (SCIENTIFIC) FAMILY (COMMON)	COMMON NAME TAXA SORT

W OF GLOBAL BREEDING RANGE WOF ATTHAT'S	STATE USFWS	GLOBAL	FAMILY (SCIENTIFIC) FAMILY (COMMON)	COMMON NAME TAXA SORT
T SPECIE.				

10000000	Species Go State Randor habitance Scoperia petersoni Periodidae GS	Capniidae Small Winter Stonefiles	Capnidae Small Winter Stoneflies
GS		r Stoneflies	r Stonefiles
52	currences ve c Reason: The pitat, making i	G4G5 S2 cles Occurrences verified in the Rank Reason: The Alberta sub for habitat, making it vulnerable	Species Occurrences verified in these Counties: Plathead, Callatin, Lincoln, Miscodia, Revaill State Rank Reason: The Hooked Snowfly is currently ranked SSZ in Montana because it was thought to be at risk due to very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to extripation in the state. Bit, recent range extensions due to newly reported collections may warrank re-evaluating this SOC rank. G4G5 SZ Mountain Streams to Species Occurrences verified in these Counties: Broadwater, Carbon, Cascade, Flathead, Gallatin, Lincoln, Mineral, Park, Stillwater, Sweet Grass, Yellowstone State Bank Reason: The Alberts snowfly is currently maked 'SZ' in Montana because it was thought to be at risk due to very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to extripation in the state. But, recent range extensions due to taxonomic changes may warrant re-evaluating this SOC rank.
	showly is currently ran able to extirpation in th	a these Countles: Broad I snowfly is currently ran rable to extirpation in th	these Counties: Flatin Showlfy is currently ran able to extirpation in th able to extirpation in th these Counties: Broad snowlfy is currently ran able to extirpation in th
	adwater, Carbon, Casc anked "52" in Montana the state. But, recent	adwater, Carbon, Casc anked '52' in Montana the state. But, recent	head, Gallatin, Lincoli anked 'SZ' in Montana the state. But, recent dwater, Carbon, Caso anked 'SZ' in Montana the state. But, recent
	cade, Flathead, Gallat a because it was thoug it range extensions due	cade, Flathead, Gailat a because it was thoug it range extensions due	in, Mssoula, Ravalli a because it was thought range extensions due transperson de code, Flathead, Gallat a because it was thought range extensions due trange extensions due
	tin, Lincoln, Mineral, P ght to be at risk due to e to taxonomic change	tín, Lincoln, Mineral, P ght to be at risk due to e to taxonomic change	e to newly reported co e to newly reported co tin, Lincoln, Mineral, P ght to be at risk due to e to taxonomic change
3601	Park, Stillwater, Sweet a very limited and/or p is may warrant re-eval	20% Park, Stillwater, Sweet a very limited and/or p is may warrant re-eval	o very limited and/or rollections may warrant 20% 20% Park, Stillwater, Sweet a very limited and/or p very l
90	t Grass, Yellowstone potentially declining fluating this SOC rank	5% It Grass, Yellowstone potentially declining this SOC rank	t re-evaluating this tre-evaluating this 5% 5% transs, Yellowstone potentially declining this SOC rankuating this social section is social section to the social section that the social section is social section to the social section that the social section t
Alpino / Mountain stronger	e g population numbers, range ik.	Mountain Streams to Rivers e g population numbers, range sk.	g population numbers, range SOC rank. Mountain Streams to Rivers e g population numbers, range sk.

		dly declining population	do limited and for rani	in MT due to extreme	idwater, Gallatin	Species Occurrences verified in these Counties: Broadwater, Gallatin State Rank Reason: This Subterranean Amphipod is currently listed as "	nces verified in the	Species Occurrences verified in these Counties: Broadwater, Gallatin State Rank Reason: This Subterranean Amphipod is currently listed as '\$152' in AT due to extremely limited and/or rapidly declining population numbers, rang		
Subterranean Aquation Ecosystems	18	100%					5152	G1G2	Crangonyctidae Gammarid Amphipods	Stygobromus puteanus Crangonyctidae A Subterranean Amphipod Gammarid Amphipods
										CRUSTACEANS
навпат	% OF AT THAT IS BREEDING RANGE	SREEDING RANGE SOF MT THAT	FWP SWAP	BLA	USFS	USPWS	STATE	GLOBAL RANK	FAMILY (SCIENTIFIC) FAMILY (COMMON)	SCIENTIFIC NAME COMMON NAME TAXA SOITT
1 SPECIES	Il ibased on mappe	COUNTY - GALLATIN Ingred on m							O TEX	THE PROPERTY OF THE PARTY OF TH

■ Potential Species of Concern

Potential Species of Concern O Species

Special Status Species

■ △ Additions To Statewide List

■ Species Removed From Statewide List

■ Species of Greatest Inventory Need

Citation for data on this website:

Montana Animal Species of Concern Report. Mont

http://mtnhp.org/SpeciesOfConcern/?AorP=a

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